



Environment Policy & Governance

LIFE PROJECTS 2013



LIFE Environment

Environment



LIFE+ Environment Policy & Governance 2013: Commission funds 125 innovation projects in 22 countries with €130.8 million

The European Commission has approved funding for 125 new environmental innovation projects in 22 countries under the LIFE+ Environment Policy & Governance programme 2013. These projects will demonstrate new methods and techniques for dealing with a wide diversity of Europe's environmental problems. The projects are led by 'beneficiaries', or project promoters, based in Austria, Belgium, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Poland, Romania, Slovenia, Spain, Sweden and the United Kingdom. They represent a total investment of €318.5 million, of which the EU will provide some €130.8 million.

LIFE+ Environment Policy & Governance in 2013

The Environment Policy & Governance strand of LIFE+ supports pilot projects that contribute to the development of innovative policy ideas, technologies, methods and instruments. Of the 961 proposals received, the Commission selected 125 projects for funding from a wide range of public and private sector organisations.

The winning projects, situated in 22 Member States, represent a total investment of €318.5 million, of which the EU will provide some €130.8 million.

Under this component, the Commission will contribute more than €41.2 million to 33 projects directly tackling climate change, with a total budget of €109.4 million. The selected projects, situated in Austria, Belgium, Germany, Spain, France, Greece, Italy, Luxembourg, The Netherlands, Poland, Sweden and the United Kingdom, are highlighted in the annex to this press release. In addition, many other projects focusing on other issues will also have an indirect impact on greenhouse emissions.

Other important areas of focus include waste and natural resources, innovation, water, and chemicals.

Background

LIFE is the EU's financial instrument to support environment and nature conservation projects throughout the EU, and in certain non-EU countries. Since 1992,

LIFE has co-financed some 4 100 projects, contributing approximately €3.4 billion to the protection of the environment. LIFE+ is the European financial instrument for the environment with a total budget of €2 143 billion for the period 2007-2013. The Commission launches one call for LIFE+ project proposals per year.

LIFE+ Environment Policy & Governance is one of three thematic components under the LIFE programme. The other two components, LIFE+ Nature & Biodiversity and LIFE+ Information & Communication, focus respectively on improving the conservation status of endangered species and habitats, and on disseminating information and raising the profile of environmental issues, or providing training and awareness-raising for the prevention of forest fires.

The LIFE programme will continue from 2014-2020 under the new LIFE Regulation for Environment and Climate Action. The programme has a total budget for the period of €3.4 billion in December 2013 prices.

More information on each LIFE+ project is available at: <http://ec.europa.eu/environment/life/project/Projects/index.cfm>

Contact details for the relevant national authorities can be found at: <http://ec.europa.eu/environment/life/contact/national-contact/index.htm>

Index of Environment Policy & Governance projects selected in 2013

Location	Project number	Title of project
AUSTRIA	LIFE13 ENV/AT/000741 LIFE Cycle Habitation	Demonstration Project with Carbon Neutral Construction and Innovative Energy Supply System
BELGIUM	LIFE13 ENV/BE/000212 LIFE-GREEN4GREY	Innovative design & development of multifunctional green & blue infrastructure in Flanders, grey peri-urban landscapes
	LIFE13 ENV/BE/000517 LIFE OxyUp	Biomass gasification for CO ₂ emissions reduction and valorisation of bio-wastes in energy-intensive industrial processes
CROATIA	LIFE13 ENV/HR/000580 LIFE.SU.SA.FRUIT	Low pesticide IPM in sustainable and safe fruit production
CZECH REPUBLIC	LIFE13 ENV/CZ/000475 LIFE2Water	Verification and assessment of technologies for tertiary treatment of municipal wastewater
DENMARK	LIFE13 ENV/DK/000668 LIFE NOVADRAIN	Innovative drainage water solutions and spatial planning
FINLAND	LIFE13 ENV/FI/000285 LIFE-FOUNDRYSAND	Re-use of surplus foundry sand by composting
FRANCE	LIFE13 ENV/FR/000222 LIFE ZENITTHYS	Zero ENERGY In Telecom-Tv HYbrid Station
	LIFE13 ENV/FR/000234 LIFE+ NOWASTHEM	Innovative solution demonstrating effective and complete valorisation of mixed solid coarse waste in a cement plant
	LIFE13 ENV/FR/000281 LIFE BeeBus	Electric Bus Rapid Transit: high capacity Bus with zero local emissions
	LIFE13 ENV/FR/000487 LIFE VANECO	Reduction of energy consumption and salt co-production during oxidation and condensation Reactions
	LIFE13 ENV/FR/000563 LIFE HICONOS	High efficiency combustion system for Non-Oxidizing furnaces for steel processing lines
	LIFE13 ENV/FR/000711 BioSolWaRe-LIFE	Bio-Solar Water Recycling: Demonstration wastewater treatment system dedicated to freshwater reuse and recycling
	LIFE13 ENV/FR/000851 LIFE+ EfficientShip	Demonstration of an innovative ORC module to improve the efficiency of European fishing vessels
	LIFE13 ENV/FR/001039 LIFE SustainEuroRoad	Demonstration of an ICT system to optimise the road construction works and reduce their environmental impact
	LIFE13 ENV/FR/001315 PTD LIFE	Dynamic Rotational grazing - Demonstration of an innovative technique to improve the environmental performance of grassland systems
	LIFE13 ENV/FR/001483 INSPIRE4LIFE	Innovative sorting process for plastic recycling
	LIFE13 ENV/FR/001512 Life ADVICLIM	ADaptation of Viticulture to CLIMate change: High resolution observations of adaptation scenarii for viticulture

Location	Project number	Title of project
GERMANY	LIFE13 ENV/DE/001131 LIFE+ CELSTAB	A novel and highly sustainable feminine pad product
	LIFE13 ENV/DE/001213 SAFR	Storage Application For Renewables
GREECE	LIFE13 ENV/GR/000414 LIFE BIODELEAR	Addressing Med fly with an innovative and environment friendly attractant through an Integrated Pest Management Strategy
	LIFE13 ENV/GR/000958 LIFE FOODPRINT	Development of an integrated strategy for reducing the carbon footprint in the food industry sector
HUNGARY	LIFE13 ENV/HU/001092 INSECTLIFE	Innovative Real-time Monitoring and Pest control for Insects
IRELAND	LIFE13 ENV/IE/000763 WISER LIFE	Working with Industrial Spaces to Exemplify Reuse
ITALY	LIFE13 ENV/IT/000140 LIFE+ DIGITALIFE	A novel manufacturing process for photocatalytically activate ceramic tiles by digital printing
	LIFE13 ENV/IT/000169 LIFE RINASCE	Naturalistic Restoration for the integrated hydraulic-environmental Sustainability of the Emilian Canals
	LIFE13 ENV/IT/000185 LIFE CARWASTE	A novel and efficient sorting process for post-shredder ELVs to meet and overcome ELV directive targets
	LIFE13 ENV/IT/000225 LIFE GIOCONDA	GIOCONDA: i GIOvani CONTano nelle Decisioni su Ambiente e salute - Youth counts in decisions on environment and health
	LIFE13 ENV/IT/000440 HFree Life Pickling	HF - Free electrolytic pickling system for stainless steel tubes
	LIFE13 ENV/IT/000461 LIFE EVERGREEN	Environmentally friendly biomolecules from agricultural wastes as substitutes of pesticides for plant diseases control
	LIFE13 ENV/IT/000470 LIFE ECODEFATTING	Environmentally friendly natural products instead of chemical products in the degreasing phase of the tanning cycle
	LIFE13 ENV/IT/000477 LIFE REPLACE BELT	Prototyping of Recycled Plastic Conveyor Belt Machine and Demonstration of Recycled Plastic Tight tolerance Applications
	LIFE13 ENV/IT/000482 LIFE PERSUADED	Phthalates and bisphenol A biomonitoring in Italian mother-child pairs: link between exposure and juvenile diseases
	LIFE13 ENV/IT/000492 LIFE+ COBRA	Cementitious Brake Control
LIFE13 ENV/IT/000535 LIFE in SustainaBuilding	Sustainable recycling in polyvalent use of energy saving building elements	
LIFE13 ENV/IT/000536 LIFE GREEN GAS NETWORK	Intelligent system to implement smart functions on gas networks to mitigate the greenhouse effect by reducing gas leaks	
LIFE13 ENV/IT/000538 MAGNHEAT-LIFE	Induction oven with rotating permanent MAGNets for energy efficient aluminium HEATING	

Location	Project number	Title of project
ITALY	LIFE13 ENV/IT/000559 AUTOPLAST-LIFE	Recycling of special plastic waste from the automotive industry
	LIFE13 ENV/IT/000583 LIFE-AGRICARE	Introducing innovative precision farming techniques in AGRiculture to decrease CARbon Emissions
	LIFE13 ENV/IT/000590 LIFE BIOCOPACPlus	BIOCOPAC: Sustainable bio-based coating from tomato processing by-products for food metal packaging
	LIFE13 ENV/IT/000593 LIFE for life's material	Titanium life in titanium hands: advanced use and reuse
	LIFE13 ENV/IT/000614 LIFE-Inno.Pro.Wire	Innovative process with new polymer coatings for eco-sustainable non-galvanized steel wires
	LIFE13 ENV/IT/000620 LIFE MED	MED Medical Equipment Discarded – A new integrated system to reduce waste by medical equipment and medical WEEE
	LIFE13 ENV/IT/000650 LIFE long WASTE-FREE LLWF	Technopolymers' sustainable extrusion process with a nanometric self-managed dehumidification method and global control
	LIFE13 ENV/IT/000655 LIFE NATURE	"New Aluminum and Titanium Use and Recycling" for the long-term protection of steel in biocorrosive special environments
	LIFE13 ENV/IT/000813 LIFE SMART4Action	Sustainable Monitoring And Reporting to Inform Forest- and Environmental Awareness and Protection
	LIFE13 ENV/IT/000840 GREEN LIFE	GREEN LIFE: Leather Industry for the Environment
	LIFE13 ENV/IT/000842 CSMON-LIFE	Monitoring biodiversity by a Citizen Science approach for solving environmental problems
	LIFE13 ENV/IT/000849 LIFE+ inREACH	inREACH: protecting health and environment by streamlining REACH compliance check at European Economic Area import stage
	LIFE13 ENV/IT/000996 LIFE GREENJOIST	Production of recycled high quality joists from wood waste
	LIFE13 ENV/IT/001033 PHOTOLIFE	Process and automated pilot plant for simultaneous and integral recycling of different kinds of photovoltaic panels
	LIFE13 ENV/IT/001069 LIFE - MERMAIDS	Mitigation of microplastics impact caused by textile washing processes
	LIFE13 ENV/IT/001107 AIS LIFE	Aerobiological Information Systems and allergic respiratory disease management
	LIFE13 ENV/IT/001203 SNOW-LIFE	Slag NO Waste: Innovative system for 100% recycling of white slag and for ZERO WASTE electric steel production
LIFE13 ENV/IT/001218 LIFE SAM4CP	Soil Administration Models 4 Community Profit	
LIFE13 ENV/IT/001225 Life Is.eco	Isover for recycling and ecosustainability	
LIFE13 ENV/IT/001238 LIFE+ K-12	LIFE+ K-12 PU Disruptive technology to dramatically improve Energy Efficiency of Household Appliances	

Location	Project number	Title of project
ITALY	LIFE13 ENV/IT/001254 LIFE - DYNAMAP	Dynamic Acoustic Mapping - Development of low cost sensors networks for real time noise mapping
	LIFE13 ENV/IT/001258 LIFE SEMENTe parTEcipata	Crop selection models and agronomy techniques adapted to local pedoclimate conditions
LATVIA	LIFE13 ENV/LV/000839 LIFE EcosystemServices	Assessment of ecosystems and their services for nature biodiversity conservation and management
LITHUANIA	LIFE13 ENV/LT/000189 LIFE Viva Grass	Integrated planning tool to ensure viability of grasslands
LUXEMBOURG	LIFE13 ENV/LU/000460 LIFE DI-CNG	Demonstration and validation of Direct Injection of CNG in vehicle engines and its environmental benefits
POLAND	LIFE13 ENV/PL/000004 LIFE-ENERGA Living Lab-PL	ENERGA Living Lab for the improvement of the energy end-use efficiency
	LIFE13 ENV/PL/000048 LIFE+ ForBioSensing	Comprehensive monitoring of stand dynamics in Białowieża Forest supported with remote sensing techniques
ROMANIA	LIFE13 ENV/RO/001077 LIFE ADB	Anti-dust solutions in Bucharest
SLOVENIA	LIFE13 ENV/SI/000148 LIFE GENMON	LIFE for European forest genetic monitoring system
SPAIN	LIFE13 ENV/ES/000067 LIFE EXTRUCLEAN	Removal of hazardous substances in polyethylene packages using supercritical carbon dioxide (SC-CO ₂) in recycling process
	LIFE13 ENV/ES/000131 LIFE iSEAS	Knowledge-Based Innovative Solutions to Enhance Adding-Value Mechanisms towards Healthy and Sustainable EU Fisheries
	LIFE13 ENV/ES/000173 LIFE GREENZO	Demonstrative pilot plant for the valorisation of non-ferrous metal waste
	LIFE13 ENV/ES/000227 LIFE REGENERA LIMIA	Development of demonstrative solutions to reduce the water contamination of agrarian origin in the Limia basin
	LIFE13 ENV/ES/000255 Life+ SUBER	Integrative management for an improved adaptation of cork oak forests to climate change
	LIFE13 ENV/ES/000263 IMPROVE LIFE	Implementing Methodologies and Practices to Reduce air pollution Of the subway enVironmEnt
	LIFE13 ENV/ES/000280 LIFE+ REWIND	Profitable small scale renewable energy systems in agrifood industry and rural areas: demonstration in the wine sector
	LIFE13 ENV/ES/000341 LIFE TRIVERS	Implementing the Water Framework Directive to temporary rivers: tools for the assessment of their ecological status
	LIFE13 ENV/ES/000375 LIFE NanoCeramiCO2	Climate Change Prevention by the inclusion of nanoparticles in clays for the reduction of Ceramic Industry CO ₂ emissions
LIFE13 ENV/ES/000377 LIFE ECOdigestion	Automatic control system to add organic waste in anaerobic digesters of WWTP to maximize the biogas as renewable energy	

Location	Project number	Title of project
SPAIN	LIFE13 ENV/ES/000417 LIFE+ RESPIRA	Reduction of exposure of cyclists to urban pollutants
	LIFE13 ENV/ES/000420 LIFE AQUASEF	Eco-efficient technologies development for environmental improvement of aquaculture
	LIFE13 ENV/ES/000426 LIFE CO2FORMARE	Use of CO ₂ as a substitute of chlorine-based chemicals used in O&M industrial processes for macrofouling remediation
	LIFE13 ENV/ES/000445 LIFE SEACOLORS	Demonstration of new natural dyes from algae as substitution of synthetic dyes actually used by textile industries
	LIFE13 ENV/ES/000488 LIFE-Aquemfree	In-Farm remediation by solar photocatalysis of agro-waste water with pesticides from remnants, cleaning and rinse
	LIFE13 ENV/ES/000504 LIFE PISA	Innovative eco friendly traps for the control of Pine Lepidoptera in urban and recreational places
	LIFE13 ENV/ES/000539 LIFE+ IRRIMAN	Implementation of efficient irrigation management for a sustainable agriculture
	LIFE13 ENV/ES/000541 Life+ ClimAgri	Best agricultural practices for Climate Change: Integrating strategies for mitigation and adaptation
	LIFE13 ENV/ES/000603 LIFE PHOTOCITYTEX	Air pollution treatment in European urban environments by means of photocatalytic textiles
	LIFE13 ENV/ES/000605 LIFESO2ZEROEF	Reduction of SO ₂ emissions by a zero-effluent wet desulfuration process using MgO by-products
	LIFE13 ENV/ES/000608 LIFE+ WHEYPACK	Reduction of CO ₂ emissions by the PHB use obtained from whey: demonstration in dairy products packaging
	LIFE13 ENV/ES/000615 LIFE ECOLAC	Prevention of dairy product's environmental impact trough ecodesign
	LIFE13 ENV/ES/000660 LIFE ENERBIOSCRUB	Sustainable management of shrubs formations for energy purposes
	LIFE13 ENV/ES/000665 LIFEAGROINTEGRA	Demonstration of Sustainable Alternatives to Chemical Products for European Crop Protection
	LIFE13 ENV/ES/000700 LIFE FACTORY MICRO-GRID	Electric vehicles to grid, renewable generation and Zn-Br flow battery to storage in industry
	LIFE13 ENV/ES/000703 LIFE RECYMAGNET	New demonstrative pilot plant for the recycling of NdFeB magnets from discarded HDDs
	LIFE13 ENV/ES/000704 LIFE-RENEWAT	Optimised Renewable Mix for Energy Saving in Waste Water Treatment Plants
	LIFE13 ENV/ES/000710 LIFE FITOVID	Implementation of Demonstrative & Innovative Strategies to reduce the use of phytosanitary products in viticulture
LIFE13 ENV/ES/000725 LIFE EWAS	Efficient and sustainable waste management methodologies using ICT tools enabling GHG emissions reduction	
LIFE13 ENV/ES/000751 LIFE TRANSFOMEM	Transformation of disposed reverse osmosis membranes into recycled ultra-and nanofiltration membranes	

Location	Project number	Title of project
SPAIN	LIFE13 ENV/ES/000776 LIFE VINEYARDS4HEAT (V4H)	Vineyards for carbon footprint reduction: a sustainable strategy to use biomass for heat & cold in wineries
	LIFE13 ENV/ES/000779 LIFE+ WOGAnMBR	Demonstration of Anaerobic Membrane Bioreactor technology for valorisation of agro-food industry wastewater
	LIFE13 ENV/ES/000800 LIFE+ TL-BIOFER	Nutrients and regenerated water recycling in WWTPs through twin-layer microalgae culture for biofertilisers production
	LIFE13 ENV/ES/000889 LIFE ECOCITRIC	Citric Waste Integrated Management
	LIFE13 ENV/ES/000923 LIFE BIOBALE	Development of a cogeneration demonstration plant from biomass forest Bales
	LIFE13 ENV/ES/000970 LIFE RELEACH	Decreasing the environmental impact of waste management: An innovative leachate treatment using recovered membranes
	LIFE13 ENV/ES/001019 LIFE SMART Hospital	A Step towards zero eMissions goAl in Heath Sector: BesT Practice Examples in Hospital Universitario Río Hortega
	LIFE13 ENV/ES/001048 LIFE ENVIPHAGE	Environmental impacts on bacterial ecology of bacteriophage use in aquaculture
	LIFE13 ENV/ES/001113 LIFE BIOSEVILLE	New biofuel production technology to recover used frying oils and power the Seville's urban bus fleet
	LIFE13 ENV/ES/001115 LIFE+ VALPORC	Valorisation of pig carcasses through their transformation into biofuels and organic fertilisers
	LIFE13 ENV/ES/001138 LIFE TEXTILEATHER	Functional textiles and leathers by innovative MLSE process
	LIFE13 ENV/ES/001159 LIFE ZAESS	Demonstration of a low cost and environmentally friendly Zinc Air Energy Storage System for renewable energy integration
	LIFE13 ENV/ES/001165 LIFE WALEVA	From Whatever Residue into Levulinic Acid – an innovative way to turn waste into resource
	LIFE13 ENV/ES/001182 LIFE EBRO-ADMICLIM	Adaptation and mitigation measures to climate change in the Ebro Delta
	LIFE13 ENV/ES/001221 LIFE-PHOTOSCALING	Sustainability of photocatalytic technologies in urban pavements: from laboratory tests to in field compliance criteria
	LIFE13 ENV/ES/001251 LIFE+ IntegralCarbon	Development and global enforcement of GHG capture photobioreactors in agroindustrial activities
	LIFE13 ENV/ES/001333 LIFE SOSTRICE	CO ₂ Emission Reduction of the Rice Cultivation Through Energy Valorisation of the Rice Straw
LIFE13 ENV/ES/001353 LIFE MEMORY	Membrane for ENERGY and WATER RECOVERY	
LIFE13 ENV/ES/001362 LIFE Fresh Box	LIFE Fresh Box: a sustainable transport solution conserving quality of fresh produce, reducing waste & fuel consumption	

Location	Project number	Title of project
SPAIN	LIFE13 ENV/ES/001513 LIFE Coop 2020	LIFE Coop 2020: pilot for rural smart grids through optimisation of energy use and innovative renewable biomass sources
SWEDEN	LIFE13 ENV/SE/001113 LIFE+ small scale CHP	Small scale Combined Heat and Power based on biomass in the region of southeast Sweden
THE NETHERLANDS	LIFE13 ENV/NL/000178 Life+ISR	LIFE+ISR-Innovative sludge reduction
	LIFE13 ENV/NL/000971 LIFE Solar Highways	Solar panels as integrated constructive elements in highway noise barriers
UNITED KINGDOM	LIFE13 ENV/UK/000401 QUARTERBACK for LIFE	Crude glycerine water used on-site as a feedstock in an anaerobic digestion reactor to produce the renewable fuel biogas
	LIFE13 ENV/UK/000493 REPURPOSE LIFE	REPURPOSE - equipping community groups in estates to reuse more, clear fly tipping and improve their local environment
	LIFE13 ENV/UK/000497 LIFE WaterLIFE	Delivery of the Water Framework Directive through collaborative action between civil society and the private sector
	LIFE13 ENV/UK/000549 LIFE SMART Waste	Smarter Regulation of Waste in Europe
	LIFE13 ENV/UK/001339 LIFE SynSpirit	Sustainable production of bio-methanol by bio-methane and biogene CO ₂ gas from organic waste and residue

Demonstration Project with Carbon Neutral Construction and Innovative Energy Supply System

Project background

Ecological housing concentrates on minimising energy consumption and has reached 'low energy', 'zero energy' and even 'plus energy' levels. However, neither the ecological nor the socioeconomic impacts of construction materials, including insulation, or the 'end-of-life' phase have received sufficient attention. Furthermore, electricity consumption has not yet been adequately included in the design of buildings.

Project objectives

The overall objective of the LIFE Cycle Habitation project is to demonstrate innovative building concepts that significantly reduce CO₂ emissions and contain a minimum of grey energy over their entire lifecycle. The ultimate goal is to design and build prototypes for carbon-neutral and 'life cycle'-oriented residential buildings, and to make energy-efficient settlements the standard, in line with EU 2020 objectives.

To this end, an energy-efficient compound, consisting of six residential units and a community centre, will be built in Traismauer, Lower Austria. These buildings will incorporate straw bales and be of different innovative construction types. They will utilise a highly innovative, energy-supply system. The aim is for renewable resources to be used to generate thermal energy and also additional electrical energy. This represents a milestone in sustainable building, with a great potential for replication and up-scaling

Expected results

- A compound of buildings, with innovative concepts and technologies, which will be carbon neutral over its entire lifecycle;
- A central prototype building in the compound, containing a community centre with a highly innovative, energy-supply system for household appliances, therefore reducing electricity consumption by 80%;
- Prototype living units that demonstrate the compatibility of energy-efficient compacted flat-roofed buildings;
- Minimum grey energy consumption, by using sustainable building materials (e.g. straw bales); and
- A highly innovative energy-supply system, with renewable resources generating thermal energy and additional electrical energy.

LIFE13 ENV/AT/000741
LIFE Cycle Habitation



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

Gruppe Angepasste Technologie

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Robert WIMMER

Duration of project:

51 months (02/06/2014 – 31/08/2018)

Total budget in euro:

3,257,143.00

EC contribution in euro:

1,610,071.00

Themes: Climate change - Energy: Energy efficiency - Energy saving - Energy supply / Environmental management: Eco-products design / Industry-Production: Building

Innovative design & development of multifunctional green & blue infrastructure in Flanders, grey peri-urban landscapes

Project background

In Europe, approximately 75% of the population lives in urban areas and this is expected to increase to around 80% by 2020. Every day, open space continues to be converted into housing, commercial and industrial buildings, and infrastructure such as roads, railways and airports. In Flanders, open space loss amounts to seven hectares/day, one of the highest rates in the European Union. These grey infrastructure elements have made Flanders the most fragmented and the second-most sealed EU region (after Malta).

The impacts of urban sprawl on peri-urban landscapes in Flanders and Europe include:

- Loss of natural habitats for species;
- Lack of natural water retention areas;
- Negative impacts on water quality;
- Negative impacts on human health, mental/physical wellbeing, recreation, social interaction; and
- Impacts in terms of climate adaptation.

Project objectives

The project will demonstrate the innovative development and design of multifunctional green and blue infrastructure (GI&BI) elements in peri-urban areas. These elements will deliver multiple ecosystem services and functions for many different interested parties. The seven densely populated pilot areas covered by the project are part of the peri-urban areas of Brussels and Hasselt-Genk. The investment in GI&BI in these areas will stimulate an integrated and multifunctional approach to the environmental and health problems linked to unsustainable urban sprawl and the greying of artificial peri-urban landscapes.

This integrated, multifunctional method of building GI&BI in densely populated peri-urban areas (such as Flanders) will be a major contribution to the implementation of the EU's Green Infrastructure Strategy in EU peri-urban areas.

Expected results

- Increased/optimised water levels and improved conditions for tree frogs and other amphibians;
- Seven ponds and six pools restored and three ecological transformations of artificial basins;
- Three restored water courses, six natural retention zones and one natural stream valley;
- 4 ha peri-urban forest and four ha natural grassland created, 100 trees and bushes planted, 1 km hedge-rows/tree rows planted, 3 ha of orchards created on former agricultural land;

LIFE13 ENV/BE/000212
LIFE-GREEN4GREY



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

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Pieter DE CORTE

Duration of project:

60 months (01/07/2014 – 30/06/2019)

Total budget in euro:

4,352,355.00

EC contribution in euro:

1,671,415.00

Themes: Biodiversity issues: Urban biodiversity / Information-Communication: Public and Stakeholder participation / Land-use and Planning: Urban design

- An 11 ha upgraded habitat area (including private gardens) for tree frogs;
- Several housing districts protected from flooding;
- 3 km of new natural meandering water course/valley and six natural water retention areas;
- Up to 7 km of hiking paths established and six meeting areas in attractive and green landscapes;
- One greener neighbourhood and five greener living environments;
- Two improved ecological areas surrounding business sites;
- Improved environmental performance in 10% of the business areas tackled;
- 3 ha of sustainably cultivated orchards for local beer production;
- Two action plans for larger peri-urban valley systems; and
- An expert group to promote new GI&BI initiatives in other EU peri-urban regions.

Biomass gasification for CO₂ emissions reduction and valorisation of bio-wastes in energy-intensive industrial processes

Project background

In 2013, the EU emissions trading system (ETS) entered its third phase. Participants must purchase emission allowances and/or implement solutions to reduce their greenhouse gas emissions. Several industrial sectors have shown an interest in Xylowatt gasification reactors. Interested sectors include the packaging glass industry and the production of bricks and tiles. The glass and bricks sectors are major consumers of energy and have limited options to reduce their carbon footprint and their dependence on fossil fuels. In addition, the gasification unit size is adapted to the size of the plants in these sectors.

Biomass gasification technology offers:

- Efficient conversion of biomass into energy: Up to around 3 Mwe (megawatt electrical), there is no industrial technology that converts biomass into electricity as efficiently as gasification. Even at hundreds of kilowatts, the power conversion efficiency reaches 30% and overall efficiency can exceed 75% in CHP applications;
- Conversion into energy of 'difficult' biomass: In addition to wood, gasification can handle recycled wood, agricultural by-products and sludge from wastewater treatment plants, thus contributing to CO₂ emission reductions and to waste management; and
- Local scale: The technology is particularly adapted to local markets and use of local resources.

Project objectives

The project's overall aim is to show that fossil fuels can be substituted in sectors that extensively use combustion processes, and that this can be done with difficult-to-treat biowaste resources.

The project aims to:

- Demonstrate a pre-industrial oxy-gasification unit, which would meet the typical needs of energy-intensive industries (outputs of 3-10 megawatts), and be economically viable;
- Maximise the fossil fuel substitution rate in specific industrial applications (brick-making and packaging glass manufacturing, given that no alternative biomass-based solution is currently available for these two sectors); and
- Demonstrate the gasification unit for various sources of biomass, with the focus on 'difficult' biomass: waste water treatment plant sludge and agro-residues.

LIFE13 ENV/BE/000517
LIFE OxyUp



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

XYLOWATT SA

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Name of contact person

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Duration of project:

53 months (01/06/2014 – 31/10/2018)

Total budget in euro:

5,456,976.00

EC contribution in euro:

2,710,488.00

Themes: Climate change – Energy: Energy supply - Reduction of greenhouse gas emissions / Waste: Waste use

Expected results

The expected outcome is the effective demonstration of an innovative environmentally friendly energy supply system for energy-intensive industries, including the glass and bricks and tiles sectors.

The beneficiary estimates that savings in terms of tonnes of oil equivalent (Toe) and reductions of CO₂ emissions per gasifier per year can amount to 1 085-2 170 Toe and 2 495-4 991 tonnes of CO₂ depending on the gasifier used.

Further carbon reductions will be achieved because the extraction and transportation of fossil fuel will no longer be needed: the gasifiers will use 'on-site' biomass, meaning no transportation, though this aspect is difficult to quantify.

Low pesticide IPM in sustainable and safe fruit production

Project background

Plant pests and diseases cause important yield and quality losses in fruit crops. Due to the hazardous effects of agrochemicals on both humans and the environment, there is a growing trend towards agro-ecosystems based on the management of ecological interactions and the use of integrated pest management (IPM).

IPM has become an accepted model for plant protection in the EU, as it helps maintain food security while addressing environmental considerations. Moreover, sustainable fruit production is a top priority for European producers. With the new Regulation on Plant Protection Products (1107/2009) and the Directive for the Sustainable Use of Pesticides (2009/128), many chemical products have disappeared from the European market, creating new challenges for pest and disease control. The promotion of low-pesticide input management, notably IPM and organic farming, has achieved a significant reduction in pesticide use, but the sustainable use of pesticides requires additional efforts to ensure technology transfer.

Project objectives

The overall objective of the LIFE.SU.SA.FRUIT project is to develop, apply and demonstrate an economically viable strategic plan to implement integrated pest management (IPM), by promoting the use of low-chemical approaches in orchards and post-harvest fruit production in typical Croatian and Italian agro-ecosystems. The project aims to create an environmentally friendly management system for fruit production and storage, by making more efficient use of resources and ensuring food safety is not compromised.

Specific objectives are to:

- Implement innovative practices in the field (e.g. insect exclusion netting systems and biocontrol agents) and post-harvest (e.g. hot water treatments) for fruit production;
- Promote practices aimed at reducing the use of pesticides; and
- Through reduced pesticide applications, lower their environmental impact and the risk of worker exposure.

Expected results

- Reduction of chemical pressure and of risks for growers (e.g. reduction of about 50% of insecticides, and of about 25% of chemicals used against diseases and pests);

LIFE13 ENV/HR/000580
LIFE.SU.SA.FRUIT



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Name of contact person

Tomislav JEMRIĆ

Duration of project:

42 months (16/06/2014 – 16/12/2017)

Total budget in euro:

1,839,378.00

EC contribution in euro:

901,938.00

Themes: Industry-Production: Agriculture – Fisheries
- Food and Beverages / Risk management: Pollutants
reduction / Waste: Waste reduction - Raw material saving

- Reduction of agricultural costs and increase in growers' profits, in terms of money and energy saved due to the use of exclusion netting systems (e.g. saving of about €300-500/ha for the control of insects);
- Reduction of fruit losses (at least 20%) from pest and fungal diseases;
- Increase of fruit quality due to the effects of nets, on the basis of quality parameters such as firmness, colour, acidity, RSR (e.g. increase of sugar content of 1-1.5° Brix in apples); and
- Reduction of pesticide residues (at least 60%, due to less insecticide and fungicide treatments, and to the hot water treatment to remove residue), and consequent increase of food safety and decrease of risks for consumers and environmental health (e.g. lower pollution of water, soil and air).

Verification and assessment of technologies for tertiary treatment of municipal wastewater

Project background

Scope exists to improve the effectiveness of conventional mechanical and biological wastewater treatment technologies in the Czech Republic. Risks currently arise from hazardous residues from pesticide compounds and medicinal substances, which can become an environmental pollutant and pose problems for human welfare. The threats can be reduced by using modern tertiary treatment systems. Such developments will help Czech municipal water authorities to meet EU standards for controlled substances, such as bisfenol, 17 alpha-ethinylestradiol (EE2), 17 beta-estradiol (E2) and diclofenac.

Project objectives

The main goal of the LIFE2Water project is to demonstrate opportunities for significantly improving the effluent standards from tertiary technologies used at wastewater treatment plants (WWTPs). Three pilot plants will be built to test more effective tertiary technologies (micro-strainer filter/UV radiation, ultrafiltration and sonolysis of ozone).

The pilot plants, which are located within municipal WWTPs, will carry out long-term tests to verify and optimise the new tertiary treatment technologies. Their efficacy will be demonstrated for the following pollutants: industrial substances (bisphenol A, nonylphenol and octylphenol and their metabolites); pesticides (atrazine and its metabolites, MCPA, MCPB); pharmaceuticals (17 α -ethinylestradiol, 17 β -estradiol and its metabolites, diclofenac, carbamazepine, naproxen); and microbial contamination (faecal coliforms, enterococci and escherichia coli) – with minimum removal efficiency of 200 cfu/100 ml.

The cost-effectiveness of technologies will be calculated and used to inform guidance for municipal authorities in the selection of appropriate technology for tertiary treatment stages.

Awareness raising will also form an important aspect of the project. Relevant stakeholders will be brought together for the exchange of knowledge, sharing of experiences and to discuss best practice in the removal of hazardous substances and other pollution threats to the aquatic environments. The public will also receive new information about the relevance of improving pollution control systems.

LIFE13 ENV/CZ/000475
LIFE2Water



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Josef ŠEBEK

Duration of project:

40 months (01/09/2014 – 31/12/2017)

Total budget in euro:

600,015.00

EC contribution in euro:

298,007.00

Themes: Risk management: Industrial risks - Hazardous substances - Pollutants reduction / Water: Waste water treatment

Expected results

- Implementation of three new pilot plants demonstrating selected technologies for tertiary treatment of municipal wastewater on a pilot scale;
- Demonstration and comparative evaluation (including cost-effectiveness) of tertiary technologies using micro-strainer filter/UV radiation, ultrafiltration, and sonolysis of ozone; and
- A set of optimal operational parameters produced for achieving a minimum removal rate of 99% for the priority substances and for the removal of microbial contamination (faecal coliform bacteria, enterococci and escherichia coli) to 200 CFU/100 mL.

Innovative drainage water solutions and spatial planning

Project background

Loss of nutrients from agricultural drainage and other drainage systems is a major problem. In order to secure good ecological status in all European waters and improve biodiversity, new innovative solutions are needed. Drainage systems can speed up water runoff and action must be taken to prevent flooding and adapt to climate change. Moreover, leaks from landfills located near surface water systems affect water quality in dependent ecosystems. Such leakage presents a challenge to meeting the requirements of the Water Framework Directive and implementing river basin management plans. Low-cost solutions are needed.

In Denmark, major efforts have been made to restore former natural wetlands. More than 12 000 ha have been restored over the past 15 years. In other countries, such as Sweden, the focus has been on smaller subsurface-flow constructed wetlands (SSF-CWs). Monitoring SSF-CWs has shown nitrogen removal of 400-2 500 kg per ha per year, and phosphorus removal of 18-48 kg per ha per year. These are quite high nutrient removal rates compared with restored natural wetlands with a typical nitrogen removal of 50-300 kg per ha per year. Currently, constructed wetlands within sub-catchments in some countries are often created without an overall sub-catchment/catchment planning strategy and thus are placed in unsuitable locations along watercourses. In the future, more strategic sub-catchment/catchment tools will be needed for optimising measures to reduce nutrient losses, as well as reduce flood risks and improve the overall ecological status, with regard to both water quality and hydromorphology.

Project objectives

The LIFE NOVADRAIN project aims to demonstrate two new innovative drainage water filtration technologies that represent cost-efficient ways of meeting the requirements of the Water Framework Directive, the Habitats Directive and the Floods Directive. The filters will reduce the loss of nutrients from agricultural drainage and other drainage systems. The project will demonstrate low-cost solutions for reducing leakage now, and under future climatic conditions. The project will target these issues by establishing 'Intelligent Buffer Zones' (IBZ) and SSF-CWs and demonstrating the use of the most appropriate technologies on a catchment and field scale.

Expected results

- Two new innovative technologies – IBZ and SSF-CW;
- SSF-CWs are demonstrated and documented;

LIFE13 ENV/DK/000668
LIFE NOVADRAIN



Beneficiary:

Type of beneficiary

Training centre

Name of beneficiary

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Name of contact person

Gertz FLEMMING

Duration of project:

60 months (01/09/2014 – 31/08/2019)

Total budget in euro:

1,705,308.00

EC contribution in euro:

837,653.00

Themes: Industry-Production: Agriculture-Fisheries/
Land-use and planning: Soil and landscape protection /
Risk management-Pollution control /Water: Water quality
improvement - Water resources protection

- Nine IBZs and two SSF-CWs established in different landscapes and the location of the new measures demonstrated on field and catchment scale;
- Intensive monitoring carried out at three SSF-CWs and two IBZs over three years;
- Six IBZs used as demonstration sites, involving local stakeholders in different regions of Denmark;
- Improvement of water quality;
- Demonstration of the retention of water in drainage systems and several multifunctional eco-services;
- Cost-benefit analysis of the two new technologies in preparation for implementation in the water management plans of Member States. Cost-effectiveness for the individual farmer will also be integrated; and
- Introduction of the new technologies to relevant organisations in at least 10 Member States and their demonstration to at least 200 farmers and representatives from 25 organisations and government agencies.

Re-use of surplus foundry sand by composting

Project background

In Europe, around 18 million tonnes of waste foundry sand is produced every year and even large landfill sites often have insufficient capacity to accept it. In most countries, several smaller landfills are being closed and replaced by large 'EU landfills'. However, the distances and transport costs to these sites are increasing for foundry companies and alternative means of treating these wastes in a more environmental friendly way are being sought.

Project objectives

The LIFE-FOUNDRIESAND project aims to promote sustainable production, waste prevention and recycling by piloting new, innovative biological methods of cleaning different foundry waste sand types and eliminating hazardous organic trace contaminants. The objective is to study the quality of the piloted samples and ensure that they fulfil the product requirements for the re-use of cleaned sand as a substitute for ground construction materials or other soil-like materials for agricultural and geo-engineering applications.

The specific objectives are to:

- Develop a new method for cleaning and re-using foundry waste sand through composting;
- Create a compost from foundry waste sand mixed with other biowaste (household waste, sludge and the waste from the food, wood and paper industries) and demonstrate the microbiological degradation processes in open heaps;
- Compare the microbiological degradation in covered landfills with the project's system;
- Verify compost quality and applicability in different fields of application (gardening, green fields, ground construction, etc.);
- Produce guidelines for foundries and suppliers of cleaning services in Europe;
- Implement the procedure in foundries to minimise their waste, reduce their operational costs and increase their energy savings;
- Reduce the amount of contaminated material entering landfill sites;
- Improve the use and acceptance of this valuable material (the cleaned foundry waste sand) for agricultural and geo-engineering applications. In areas with low humus content in soils, an artificial layer can be created in order to improve fertility, and to substitute for synthetic fertilisers; and

LIFE13 ENV/FI/000285
LIFE-FOUNDRIESAND



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Markku TAPOLA

Duration of project:

38 months (01/08/2014 – 30/09/2017)

Total budget in euro:

2,051,644.00

EC contribution in euro:

996,070.00

Themes: Industry-Production: Metal industry / Risk management: Industrial risks - Hazardous substances - Pollutants reduction / Waste: Hazardous waste - Industrial waste - Waste recycling

- Transfer this sustainable methodology to the 4 000 plus foundries in Europe. By 2020, an estimated 200 foundries will be applying this new method, and by 2025, this figure will have increased to 1 000.

Expected results

- New composting method developed for cleaning foundry waste sand;
- Around 500-600 tonnes of foundry waste sand cleaned at pilot composting facilities in Finland and Spain;
- Feasibility and cost-effectiveness of the new method calculated for Finland, Germany and Spain as pilot countries;
- Hazardous organic compounds (such as phenols, PAHs) cleaned with an efficiency of more than 95%. The final composted product will meet the national requirements for such materials;
- Reduction of methane emissions in comparison with landfilling; and
- CO₂ equivalent emissions reduced by more than 80%

Zero ENergy In Telecom-Tv HYbrid Station

Project background

The largest radio frequency networks are designed for broadcasting television and radio services and for mobile communications. The success of mobile communications has boosted demand for denser and more sophisticated telecommunications networks. As a result, the number of relay stations for broadcast networks is now ten-times greater than the number of telecommunication network sites. In the meantime, the switch from analogue to digital broadcasting has taken place. An increasing number of transmitting stations are installed in cities, leading to higher energy consumption, electromagnetic fields and visual pollution. As most countries intend to discard analogue television by 2015, a large number of frequencies will be freed up to increase the capacity of telecom networks, especially in the UHF (ultra-high frequency) band. However, the environmental impact of the development of telecom and broadcast networks has not so far been sufficiently assessed.

Project objectives

The LIFE ZENITTHYS project aims to drastically reduce the carbon footprint and other negative environmental impacts (visual and electromagnetic pollution) of telecom networks by developing an innovative hybrid transmission station concept that capitalises on recent advances in electronic devices, signal processing and renewable technologies.

The project will build and test a 200-watt autonomous and low-greenhouse gas emitting hybrid base station that will be used for both high-definition television services and telecommunications high power relay. Its development will be a step towards more eco-friendly communication networks.

Expected results

- Reduction in the power consumption of the station by at least 40% (5.7 MWh/year);
- Energy supply to the station met entirely from renewable sources (wind turbine, solar panels).
- On the basis of 90 grammes of carbon dioxide per kilowatt hour, and the average annual CO₂ emissions of a standard telecom station and a standard broadcast station (12 Mwh/year; 1.08 tonnes CO₂/year), the hybrid station reduce greenhouse gas emissions by 0.567 tonnes CO₂/year compared to standard facilities. The emissions would be reduced further by on-site production of renewable energy;

LIFE13 ENV/FR/000222
LIFE ZENITTHYS



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Jérôme DAVID

Duration of project:

36 months (01/06/2014 – 31/05/2017)

Total budget in euro:

2,496,419.00

EC contribution in euro:

1,175,459.00

Themes: Climate change – Energy: Energy efficiency – Energy saving – Energy supply – Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies / Land-use and Planning: Soil and landscape protection

- Reduction of electromagnetic radiation from 60 to 0.6 volts per metre;
- Reduction in visual pollution from the replacement of macro-base 3G antennae with smaller 4G stations; and
- Reduction in the number of transmitting antennae in cities by 50%.

Innovative solution demonstrating effective and complete valorisation of mixed solid coarse waste in a cement plant

Project background

Waste management remains a major stumbling block in the fulfilment of sustainability objectives outlined in the Europe 2020 Strategic Agenda.

In many European regions, 'difficult waste' - such as mixed coarse solid waste (e.g. as sorting rejects or cumbersome waste) or hazardous waste - is still disposed of in an insufficiently controlled manner, treated in inefficient incinerators or dumped in landfill sites. This is done despite the accepted principle that waste disposal in or on land should be considered the least desirable option, because it can have a significant negative impact on the community. The continuous extension of waste collecting, sorting and recycling has resulted in the production of high volumes of residual coarse solid waste, much of which is incinerated. Unfortunately, most industrial incinerators have only 12% to 25% energy efficiency, and moreover the ash residue represents an environmental hazard.

Project objectives

The project will demonstrate an innovative cogeneration method to unite cement production with the recycling of mixed coarse solid waste. The energy produced by a thermal waste pre-treatment process (pyro-gasification) will be used for cement production purposes, which will result in substantial fossil fuel savings. The technology will work alongside sorting and recycling activities, which generate a significant volume of coarse waste (up to 70%).

The solution will be demonstrated at the industrial scale, in a fully operational cement kiln, by converting four tonnes/hour of residual waste into gas and char, directly fed to the main burner. The whole process will be disseminated to cement production plants across the European Union.

Expected results

- The demonstration plant in Héming (in eastern France) will process about 25 000 tonnes of hazardous and non-hazardous mixed coarse solid waste per year, providing a thermal capacity of 10 megawatts (approximately four tonnes per hour at an average Lower Heating Value of 12 megajoules/kg);
- All of the waste will be transformed into useful products resulting in 7 000-7 500 cubic metres per hour of synthetic gas, which will be used in the main

LIFE13 ENV/FR/000234
LIFE+ NOWASTHEM



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Stéphane POELLAER

Duration of project:

50 months (01/06/2014 – 31/07/2018)

Total budget in euro:

8,914,400.00

EC contribution in euro:

1,986,450.00

Themes: Climate change – Energy: Energy supply / Industry-Production: Building / Risk management: Industrial risks – Hazardous substances / Waste: Construction and demolition waste – Hazardous waste – Waste recycling – Waste use

burner of the cement kiln, and about 5 000 tonnes of char per year to be used as raw material for the production of clinker (which can then be used to make cement). This will replace about 8 000 tonnes/year of oil, cutting CO₂ emissions by 25 000 tonnes/year.

Electric Bus Rapid Transit: high capacity Bus with zero local emissions

Project background

About 75% of the EU population lives in urban areas. The trend towards urban living is continuing and durable, and according to the European Environment Agency, around 80% of Europeans will be living in urban areas by 2020 (EEA Report N°10/2006).

The concentration of people in expanding urban areas has implications for mobility. Urban mobility and transport are vital for cities. It has become clear in recent years that the development of public transport is a key factor for sustainable cities. Urban public transport must meet the challenge of sustainability, by developing reasonably priced services that have a minimised negative impact on the environment. Likely solutions will feature mass transit means (heavy metros) and local systems, with intermediate medium-size capacity transport systems such as Light Rail Transit (tramways or light metros) or Bus Rapid Transit (BRT) systems.

Project objectives

The LIFE BeeBus project will test and demonstrate an innovative green urban transport solution: the eBRT, an electric bus designed for quick recharging during stops at passenger stations.

The use of electric propulsion reduces emissions of many pollutants. In addition, thanks to the full recovery of kinetic energy during braking, the overall system performance is significantly more efficient than diesel buses.

The potential uptake of the BeeBus technology is reinforced by its reasonable implementation cost that is substantially lower than a tram line. The total cost of ownership will be reduced by the eBRT's energy efficiency. Lastly, the batteries are designed to have very long lifetimes thanks to their limited depth of discharge of 7-10 years, twice as long as that of batteries of electric buses that are currently in service.

Specifically, the project aims to:

- Demonstrate two prototype vehicles (18 metres) with quick-charging interfaces;
- Equip seven bus stations with charging stations (mainly financed by SMTC Grenoble); and
- Establish a complete central management system (energy management, operation supervision).

LIFE13 ENV/FR/000281

LIFE BeeBus



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Valérie CORNETET

Duration of project:

42 months (01/06/2014 – 30/11/2017)

Total budget in euro:

7,040,232.00

EC contribution in euro:

2,268,782.00

Themes:

Air and Noise: Air pollutants / Climate change
– Energy: Energy efficiency - Energy saving - Reduction of greenhouse gases emissions / Land-use and Planning: Transport planning - Traffic monitoring / Risk management: Pollutants reduction

Expected results

- CO₂ emissions reduced by 192 tonnes in total during the project;
- Energy consumption per passenger: 12-15 watt hours per kilometre;
- Reduction of pollutants by the following amounts:
 - Nitrogen oxides: 359 kg;
 - Carbon monoxide: 251 kg;
 - Hydrocarbons: 6 kg;
 - Particulate matter: 6.5 kg; and
 - Noise level of only 75 decibels (at 50 km/h) and 70 dB (at stop).

Reduction of energy consumption and salt co-production during oxidation and condensation Reactions

Project background

With a more than 30% share of total industrial energy use worldwide (including feedstocks), the chemical/petrochemical sector is by far the largest energy user in industry, with related high levels of greenhouse gas emissions. According to the European Environment Agency, the European chemicals industry, including pharmaceuticals, agrochemicals, food, electronics and petrochemicals, emitted in 2010 a total of 165.8 megatonnes of CO₂ equivalent.

In particular, oxidation and condensation processes in the chemicals industry have a major negative impact on the environment. These two reactions are used in many chemical sub-sectors, such as petrochemical monomers including olefins, resins, and polycondensates PET/PA/PU, agrochemicals, pharmaceuticals and fine organic chemicals. These reactions are very energy consuming and generate substantial quantities of saline aqueous effluents as by-products.

Project objectives

The LIFE VANECO project aims to reduce the chemical industry's pollutant emissions by improving the energy efficiency of chemical reactions and minimising the production of effluents as by-products.

The project will focus on reducing the negative environmental impact of the production of vanillin, an organic compound that is the primary component of the extract of the vanilla bean. This extraction process normally includes two oxidation reactions and one condensation reaction, and produces more than 400% by volume of salt by-products. The technology developed by the beneficiary involves improvements to the synthesis process, such as the production of diphenol in a unique oxidation-condensation phase and the use of catalysts in the final step of vanillin distillation.

Expected results

- A 21% reduction in energy consumption and CO₂ emissions (from 835 gigajoules to 660 gigajoules and from 60 kilotonnes to 48 kilotonnes, respectively); and
- An 80% reduction in volume of the salt by-product, and valorisation of the 20% of salt remaining. The reduction in volume of the by-product will also allow the consumption of soda and sulphuric acid raw materials to be reduced by 80%.

LIFE13 ENV/FR/000487
LIFE VANECO



Beneficiary:

Type of beneficiary

International enterprise

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François METZ

Duration of project:

66 months (01/06/2014 – 30/11/2019)

Total budget in euro:

10,911,801.00

EC contribution in euro:

3,242,567.00

Themes: Climate change – Energy: Energy efficiency
- Energy saving - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies / Risk management: Pollutants reduction / Waste: Industrial waste - Waste reduction - Raw material saving - Waste use

High efficiency combustion system for Non-Oxidizing furnaces for steel processing lines

Project background

The European (EU28) steel industry employs around 360 000 and produces almost 170 million tonnes of steel. This industry has a higher than average energy consumption and releases 1.8 tonnes of CO₂ equivalent per tonne of steel produced. Together with the chemical, petro-chemical and mineral (non-metallic) industries, the iron and steel industry is responsible for around 70% of anthropogenic greenhouse gas emissions. On its own, the industry is responsible for 27% of these emissions, and for almost seven per cent of the world's total CO₂ emissions.

Project objectives

The project aims to demonstrate a technology that will reduce energy consumption, and therefore CO₂ and NOx emissions, in the steel processing industry. In particular, the project will test and approve a combustion system that uses an innovative rotating regenerator exchanger (a type of heat exchanger) in non-oxidizing furnaces (NOF). This technology will be tested at pre-industrial level in the ArcelorMittal plant, at Mardyck, in France.

During steel processing, waste gases from continuous galvanizing lines (CGL - applies a zinc coating to the surface of steel) and continuous annealing lines (CAL - a process of heating and cooling that softens the material) are conveyed to the stack via a centralised recuperator (a special purpose counter-flow energy recovery heat exchanger). This recuperator preheats combustion air to temperatures near 450°C, feeding the direct-fired furnace burners for combustion with natural gas. The combustion then preheats the steel strip.

The innovation that the project will demonstrate involves replacing the classic recuperator with a rotating regenerator exchanger, to preheat combustion air up to 1 000°C in order to:

- Decrease energy consumption of the natural gas used to preheat the steel strip at the NOF; and
- Decrease the CO₂ and NOx emissions produced during the combustion of natural gas.

Expected results

The project will be implemented in a galvanizing line plant with a nominal capacity to produce 350 000 tonnes of steel per year, and a current NOF consumption of 181 kWh of natural gas per tonne of steel. If successful, this new technology expects to achieve the following results:

LIFE13 ENV/FR/000563
LIFE HICONOS



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Name of contact person

Ludovic FERRAND

Duration of project:

36 months (01/06/2014 – 31/05/2017)

Total budget in euro:

4,101,431.00

EC contribution in euro:

1,301,263.00

Themes: Climate change – Energy: Energy efficiency
– Energy saving – Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies / Industry-Production: Metal industry

- Decrease the energy consumption by 23% from 181 kWh to 140 kWh per tonne of steel;
- Lower the yearly CO₂ emissions by up to 23%, from 11 707 tons to 9 055 tonnes; and
- Reduce the yearly NOx emissions by up to 10%, from 26 tonnes to 23 tonnes.

If successful, the prototype will be recommended to over 300 plants worldwide.

Bio-Solar Water Recycling: Demonstration wastewater treatment system dedicated to freshwater reuse and recycling

Project background

While Europe is considered to have adequate water resources, water scarcity and drought is an increasingly frequent and widespread phenomenon in the EU. According to recent estimates, at least 11% of Europe's population and 17% of its territory had been affected by water scarcity by 2007. This puts the cost of droughts in Europe over the past 30 years at €100 billion. The European Commission expects further deterioration if the temperature continues to rise as a result of climate change.

The financial cost of drinking water is related to treatments performed upstream and downstream of where the water is used. These treatments use chemical substances in significant quantities and need energy to pump, pressurise, inject and heat water for treating the sludge. Some processes such as the desalination of seawater or brackish water can consume 4-10 kWh per m³ of treated water – this is not a sustainable solution.

Two EU Directives raise the issue of wastewater re-use: the Urban Wastewater Treatment Directive (91/271/EEC) and the Water Framework Directive (WFD) (2000/60/EC).

Project objectives

The BioSolWaRe-LIFE project aims at improving wastewater treatment in order to fight water scarcity and the degradation of water ecosystems. The project will develop and test an innovative and more efficient wastewater treatment method based on an ecological process called bio-solar purification (BSP). This process uses biological and solar technologies to enable 80% water re-use and the recovery of greenhouse gas and organic wastes.

BSP technology uses phytoplankton photosynthesis and photo-oxidation (oxidation caused by the action of light) in closed tubular systems to remove a wide range of dissolved compounds and hazardous bacteria from the wastewater.

Expected results

The project expects to develop an operational pilot wastewater treatment plant that will:

- Allow fresh water savings through re-use and recycling;
- Process 50 m³ of wastewater per day; and
- Reduce energy requirements to 0.1 kWh/m³ (this is an energy saving of 95% compared to the reverse

LIFE13 ENV/FR/000711
BioSolWaRe-LIFE



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Laurent SOHIER

Duration of project:

54 months (01/07/2014 – 31/12/2018)

Total budget in euro:

2,322,837.00

EC contribution in euro:

1,146,793.00

Themes: Climate change – Energy: Energy efficiency

- Energy saving - Reduction of greenhouse gases

emissions / Environmental management: Cleaner

technologies / Water: Waste water treatment

osmosis technique – currently the most common method for large-scale water treatment).

The wide dissemination of this new procedure will allow smaller communities to comply with the water-related European regulations. Wastewater treatment plants based on this new scheme will target a market of communities and small towns from 10 to 10 000 inhabitants.

Demonstration of an innovative ORC module to improve the efficiency of European fishing vessels

Project background

According to the scientific community, innovative solutions have to be found to limit the impact of GHG emissions on our planet. Climate change is something that all economic sectors are involved in and effected by. They should therefore find innovative solutions to reduce their GHG emissions. The European fisheries sector generates GHG emissions because its fishing fleet is largely run on diesel engines. These emissions need to be reduced.

Project objectives

The LIFE+ EfficientShip project will demonstrate the efficiency of an innovative technology for reducing the GHG emissions of thermal engines with power rates from 300 kW to 2 MW, by 5-10%. This will be done by adapting the innovative heat recovery technology (based on the thermodynamic cycle Organic Ranking Cycle (ORC), which converts heat into work) to mobile thermal engines in fishing vessels.

The interest in ORC has grown over the past few years, with different applications in heavy industries or biomass production centres that work with power rates of MW. The project will develop and demonstrate the first example ORC module adapted to mobile engines, working with power rates under 1 MW. This technology will be installed on an Irish fishing boat and will be tested over seven months.

Expected results

- The construction of an operational and tested prototype ORC module, installed on an Irish fishing vessel;
- A reduction of around 5-10% of the greenhouse gas emissions, saving a total of 2.5 tonnes of CO₂ in the test phase;
- A decrease of 5-10% of fuel consumption;
- A reduction of 5-10% of the oil budget; and
- The elaboration of five case studies simulating the use of this technology in European fishing vessels. This will enable partners to provide concrete data to ship-owners that may be interested in the module.

LIFE13 ENV/FR/000851
LIFE+ EfficientShip



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Arthur LEROUX

Duration of project:

31 months (01/06/2014 – 31/12/2016)

Total budget in euro:

1,245,666.00

EC contribution in euro:

622,833.00

Themes: Climate change – Energy: Energy efficiency – Energy saving – Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies / Industry-Production: Agriculture – Fisheries – Engines – Machinery – Vehicles

Demonstration of an ICT system to optimise the road construction works and reduce their environmental impact

Project background

The road transportation industry is responsible for more than 20% of European CO₂ emissions, with 5% of those emissions generated by road construction. Little has been done to date to address the impact of this sector. Apart from the energy and fuel used to lay tarmac, energy is also needed to produce and refine materials and transport materials and equipment. It is important to note that the energy needed to construct one kilometre of a one-lane road is the equivalent of burning 86 940 litres of petrol.

Project objectives

The LIFE SustainEuroRoad project proposes to fine tune and validate innovative software to drastically reduce the environmental impact of road construction and maintenance in Europe. If properly tested on different types of roads and environments, this software could be used in the technical specifications of the work on every road in Europe, significantly improving construction techniques for this sector.

The project has two main targets:

- Reducing the consumption of energy, including fossil fuel and natural resources; and
- Decreasing GHG emissions linked to road building and maintenance processes.

The software will consist of a computerised decision-support tool that will be able to calculate CO₂ emissions, energy consumption and the use of natural resources in road construction and maintenance from the design phase through the entire lifecycle.

To validate these ambitious targets, the software will be tested in four demonstration sites (France, Germany, Hungary, Spain) under different technical requirements (new road vs. renovation, and motorway vs. road) and different meteorological conditions (Atlantic in France, Continental in Germany and Hungary, Mediterranean in Spain).

This software will be a unique tool which decreases costs whilst ensuring the quality of the roads remains high. It will enable local authorities to record environmental assessments of road activities and explain the use of public funds in this domain.

LIFE13 ENV/FR/001039
LIFE SustainEuroRoad



Beneficiary:

Type of beneficiary

Professional organisation

Name of beneficiary

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Duration of project:

36 months (01/06/2014 – 31/05/2017)

Total budget in euro:

1,311,980.00

EC contribution in euro:

655,990.00

Themes: Climate change – Energy: Energy efficiency – Energy saving – Reduction of greenhouse gases emissions / Environmental management: Life Cycle Assessment-Management / Waste: Waste reduction – Raw material saving

Expected results

The project will develop software that:

- Assesses the environmental impact of the construction and maintenance of road infrastructure;
- Creates 37% energy savings;
- Reduces CO₂ emissions by 31%; and
- Decreases the consumption of natural compounds by 70%.

Considering that European countries built around 13 600 km of roads in 2009, and that the average CO₂ emission rate can reach up to 100 TCO₂/km, estimations show that emissions could have been reduced to 421 600 TCO₂ in 2009.

Dynamic Rotational grazing - Demonstration of an innovative technique to improve the environmental performance of grassland systems

Project background

Except for very limited areas of special natural grassland types, most European grasslands are maintained through grazing or cutting. However, changes in agricultural practices and land-use pressures mean that grasslands are disappearing at an alarming rate and are nowadays among Europe's most threatened ecosystems.

Project objectives

The PTD LIFE project aims to validate an innovative technology to improve the environmental performance of grassland systems and ensure their sustainability. Specifically, the project plans to develop and test an agro-environmental method called "dynamic rotational grazing" (DRG), and demonstrate its beneficial technological, ecological and economic impacts.

This new method will be based on the study of sustainable agro-environmental systems. It will be tested on the farms of 120 cattle breeders, in partnership with local actors and specialised providers. Specific actions to be implemented include the preservation of hedgerows, the improvement of good breeding practices, and the selection of the most appropriate grass species.

Scientific field measurements will be used to assess the effects of DRG practices on the environmental and economic sustainability of livestock farming. These will cover aerobic biodiversity in soils, fertiliser use, carbon capture, greenhouse gas emissions and farming profitability. The establishment of a network of producers will allow for the implementation of a dissemination policy at European level.

Expected results

- Implementation of DRG by 120 livestock breeders, improving the sustainability of their business in the face of climate change;
- Increased environmental resilience on at least 50 of the 120 farms applying DRG;
- Elimination of the use of nitrogen fertilisers, reducing nitrogen leakage into soils and nitrate contents into ground waters;
- Improved aerobic diversity, contributing to humification and mineralisation in grassland soils;
- Improved carbon capture in permanent grassland soils;

LIFE13 ENV/FR/001315
PTD LIFE



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Duration of project:

60 months (01/06/2014 – 01/06/2019)

Total budget in euro:

2,729,751.00

EC contribution in euro:

1,364,875.00

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Habitats: Grasslands / Industry-Production: Agriculture – Fisheries / Land-use and Planning: Soil and landscape protection / Risk management: Pollutants reduction

- A 46% reduction in greenhouse gas emissions from farming activities;
- Reduced production costs for livestock farmers.

Innovative sorting process for plastic recycling

Project background

Industrial plastic waste is a growing waste stream in the EU. This includes plastic pieces coming from end-of-life vehicles (ELVs), waste electrical and electronic equipment (WEEE) and furniture. However, this waste does not yet benefit from a proper recycling chain, largely due to the challenges of automating the sorting process.

Imperfect sorting means that when industrial plastic waste is processed, the recycled plastic obtained is not of the highest quality possible. This in turn makes it difficult to exploit the material in the production of secondary materials and large amounts are landfilled, incinerated or shipped to Asia.

Project objectives

The INSPIRE4LIFE project aims to demonstrate, at a pilot scale, an innovative automated sorting process to improve the quality of recycled industrial plastic materials and the re-use of large plastic pieces. The new process will aim to significantly increase the productivity of industrial plastic waste sorting compared to the average of 0.25-0.3 tonne/hour achieved by the current best available technology.

This innovative sorting system will allow an initial fast processing of large plastic pieces at the dismantling stage of the end-of-life object. Improved sorting will then lead to a higher quality recyclate, for example, as granulate, as the output of the process. This will be immediately exploitable by compounders to produce and sell secondary materials to polymer producers. The quality of the recycled material achieved should open the way to its use in a greater range of products and markets.

The project will pave the way for the scaling-up of this demonstration plastic waste treatment process in industrial-scale installations across Europe after the project ends. This would achieve a significant increase in the volume of recycled industrial plastic and the range of polymer types processed.

Expected results

- An automated sorting process for industrial plastic waste with a capacity of 1.0 tonne/hour, for an investment of €200 000-300 000;
- The pilot plant will be able to process 200 tonnes/year of polymeric waste, based on its operation for four hours/day and 200 days/year;

LIFE13 ENV/FR/001483
INSPIRE4LIFE



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

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Stephane SENAC

Duration of project:

36 months (02/06/2014 – 31/05/2017)

Total budget in euro:

1,672,805.00

EC contribution in euro:

828,902.00

Themes: Climate change – Energy: Energy efficiency
- Energy saving - Reduction of greenhouse gases emissions / Waste: Packaging and plastic waste - Waste recycling

- An increase of the purity of the output plastic of up to 99%;
- A reduction of two tonnes of CO₂ emissions per tonne of waste;
- A reduction in energy use of 20 000 MJ per tonne of waste;
- The installation of 50-200 systems throughout Europe during the next 10 years;
- An increase of up to 20% by weight (1 million tonnes) in the amount of industrial plastic waste recycled from different waste streams.

ADaptation of Viticulture to CLIMate change: High resolution observations of adaptation scenarii for viticulture

Project background

Agriculture is a contributor to the release of greenhouse gases into the atmosphere, and is highly exposed to the effects of climate change, with many farming activities directly dependant on weather conditions. Climate change impacts affecting EU agriculture include changes to annual rainfall and extreme events such as heatwaves, droughts, storms and flooding. As part of the agricultural sector, viticulture is both a contributor to climate change and affected by it. Although many studies have addressed the issue of the impact of climate change on viticulture, few studies are devoted to observing and simulating the climate and climate change at the local scale in wine-growing regions.

Project objectives

LIFE ADVICLIM aims to improve local management of vineyards in the face of climate change. It will develop tools to measure and model both contributions to climate change and the impact of climate change. It will build on these to help identify the best responses to mitigate and adapt to the impact of climate change in vineyards.

The project will study the climate at the local scale, including analysing local climate variability within vineyards. It will develop and use climate models, taking account of both climate change simulations and local climate variability, and it will develop a software tool to help vineyard managers to measure their CO₂ emissions. Based on the emissions calculations and climate scenarios developed, the project will identify the most appropriate practices to be applied in order to adapt to and mitigate the impact of climate change. It will implement these practices in a group of six selected pilot sites, which are representative of climate diversity in vineyards in Europe, and provide a thorough analysis of the results.

To further promote the importance of local management of vineyards, the project will create a network of professionals from the sector. It will also create a web platform to facilitate exchange between them and the dissemination of the project's tools and models.

Expected results

- Climate models for the very local scale in vineyards;
- A software tool to help vineyard managers measure and reduce their CO₂ emissions;

LIFE13 ENV/FR/001512
Life ADVICLIM



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Hervé QUENOL

Duration of project:

60 months (01/07/2014 – 28/06/2019)

Total budget in euro:

3,019,930.00

EC contribution in euro:

1,426,587.00

Themes: Climate change – Energy: Adaptation to climate change - Reduction of greenhouse gases emissions / Environmental management: Life Cycle Assessment-Management / Industry-Production: Agriculture – Fisheries / Risk management: Pollution control

- Implementation of mitigation and adaptation measures in pilot sites, achieving at least a 20% reduction in GHG emissions by the end of the project (at least 67.5 tonnes of CO₂ equivalent for the six pilot sites).
- A Best Practices Manual on adaptation and mitigation measures for vineyard owners; and
- A network of vineyard owners and a supporting web platform for information and exchange.

A novel and highly sustainable feminine pad product

Project background

The raw material of common sanitary pads is mainly cellulose and low-density polyethylene (or other synthetic components). Past experiments to develop biodegradable absorbent or similar devices (menstrual cups and paper-cotton based products) for the feminine hygiene sector have not been commercially successful owing to their lack of comfort and the difficulty of producing them to the high quantity required. In fact, these alternative products account for less than 5% of the market, despite the rise in interest in sustainable solutions among consumers.

Reducing the environmental impact of products (related to resource consumption, transport and packaging) must not jeopardise their technological performance. Nevertheless, their impact is great: a single disposal absorbent pad takes around 500 years to biodegrade in a landfill site and around 30 million are used in Europe every day.

P&G research and development activities, however, have led to several new patented applications that have the potential to substantially reduce waste and improve environmental performance.

Project objectives

The LIFE+ CELSTAB project will demonstrate on an industrial scale the feasibility of upscaling and integrating processes for the production of a new absorbent core and cellulose component for a specific feminine hygiene product. The process will combine the mentioned patents in a new multilayer arrangement that uses 15-25% less material and reduces emissions by 10-15% tCO₂ equivalent per year. The overall target for waste prevention is 15-25%.

Specifically, the project aims to demonstrate that this updated innovative multi-layer material concept and technology can meet consumer product, quality and industrial-scale production process requirements (absorbency, dryness, flexibility, comfort, etc.) whilst improving the cost-benefit ratio.

The project aims to prove that the manufacturing and logistics related to the new disposal pads offer environmental benefits as a result of the reduced material use. The overall lifecycle consists of less packaging, greater resource efficiency and reduced transport. Finally, the project aims to showcase the technology in order to influence the European market and policy makers to shift towards a more eco-oriented product development.

LIFE13 ENV/DE/001131
LIFE+ CELSTAB



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Mariangela CAPUTI

Duration of project:

42 months (01/07/2014 – 31/12/2017)

Total budget in euro:

2,840,897.00

EC contribution in euro:

1,420,448.00

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Environmental management: Eco-products design / Waste: Waste reduction - Raw material saving

Expected results

- Optimised design of a novel combination of air laid and multilayer absorbent product, validated through industrially manufactured prototypes;
- Validated blueprint of upscaled and integrated manufacturing process of novel multilayer absorbent products;
- Life-cycle analysis of the product and manufacturing process;
- Demonstration of the technological and environmental improvements of using a variety of locally sourced pulps in order to improve the mechanical strength of the multilayer structure; and
- Validated use of bio-based components (cellulose from varying fibres properties) within the absorbent materials in the feminine hygiene category.

Storage Application For Renewables

Project background

A key priority of the EU is to reduce CO₂ emissions and promote renewable energy sources. The related quantified goals are laid down in the EU '20-20-20' targets. To reach these targets, the actors along the electricity value chain need to overcome some technical and operational challenges. Energy storage is considered to play a critical role in this regard. However, the wider deployment of currently available technologies for long-term storage is limited due to geographic site requirements, development gaps and capital costs.

The transition towards a more sustainable European energy system poses a number of challenges for electricity grids, and new ways to facilitate an increased feed-in of volatile distributed renewable energy sources (DRES) are required.

Project objectives

The project Storage Application For Renewables (SAFR) aims to enable a further expansion of the share of DRES by developing an innovative and highly flexible thermoelectric energy storage system. This system, which will be demonstrated on Fehmarn Island, will operate as a flexible load (in order to avoid congestion) and as a generation unit (serving as a source of electricity in times of peak demand). The storage solution is highly flexible, location-independent and operates emission-free.

Specific objectives are to:

- Demonstrate an innovative thermoelectric energy storage technology that can be used on a decentralised level and flexibly adapted to the specific application;
- Optimise the electricity network utilisation locally and reduce the need for network extension in general;
- Evaluate the technical performance and the environmental and economic benefits of the storage technology; and
- Evaluate the operating models for this new type of storage technology and the financial models for enabling the participation of local, private and municipal actors.

Expected results

- A high-temperature thermoelectric energy storage system;
- Optimised electricity network utilisation as demonstrated on Fehmarn Island where electricity consump-

LIFE13 ENV/DE/001213
SAFR



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

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Duration of project:

36 months (01/06/2014 – 31/05/2017)

Total budget in euro:

20,320,874.00

EC contribution in euro:

5,759,576.00

Themes: Climate change – Energy: Energy supply - Reduction of greenhouse gases emissions / Services and Trade: Transportation – Storage

- tion from renewable energy sources will be increased from currently 89% to approaching 100%;
- Verified technical, environmental and economic performance, with the results summarised in reports;
- A novel operating model and financing concept that enables local, private and municipal actors to invest in these technologies;
- Demonstration of the technical feasibility of using the cogenerated heat locally; and
- By replacing the current heat supply, around 880 tonnes of CO₂ will be saved annually.

Addressing Med fly with an innovative and environment friendly attractant through an Integrated Pest Management Strategy

Project background

The Mediterranean fruit fly or 'Med fly' is considered to be one of the world's most destructive pests, particularly in regards to agriculture. It has the widest host range of any fruit fly, is a rapid coloniser and can tolerate cooler climates than other species of fruit flies. The Med fly attacks more than 260 different fruits, flowers, vegetables and nuts.

This pest is usually controlled through the use of insecticides and other chemical plant-protection products. Plants, however, can build up a resistance to these chemicals, which moreover have a range of negative impacts on the environment. Alternative methods of combating the Med fly are available including the use of chemical and biological attractants, sterilisation of male flies and mass trapping. But such methods are mostly non-selective, affecting a large number of beneficial insects as well. The project coordinator has already developed and patented a product, Biodelear, which acts selectively and attracts or acts on female Med flies only.

Project objectives

The BIODELEAR project aims to:

- Implement an innovative, patented, environmentally friendly and low-cost food attractant (Biodelear) for the control of Med fly on a large scale. The attractant is non-toxic to humans and selectively attracts female Med flies and virtually none of the non-targeted insects;
- Eliminate the use of insecticides, which are toxic to humans and the environment and decrease biological diversity;
- Develop a sound, integrated and environmentally sustainable management strategy to address the Med fly problem in the Mediterranean region, using as an example the cultivation of citrus trees;
- Make Mediterranean farming less dependent on pesticides in line with current EU policies; and
- Enhance biological diversity by eliminating the residue levels of pesticides in human food and animal feed.

Expected results

- Web inventory of the pilot area;
- Reduction in the percentage of the fruit infestation to under the threshold of 1%;
- Negligible impact on the biological diversity in the pilot orchard;
- Steady, annual reduction in the population of the Med fly;

LIFE13 ENV/GR/000414
LIFE BIODELEAR



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Name of contact person

Vassilis MAVRAGANIS

Duration of project:

60 months (01/06/2014 – 01/06/2019)

Total budget in euro:

2,205,454.00

EC contribution in euro:

1,102,727.00

Themes: Industry-Production: Agriculture – Fisheries / Risk management: Pollutants reduction

- A scientific, technical and financial analysis of the method;
- Strengths, weaknesses, opportunities and threats (SWOT) and cost/benefit analyses;
- Development of an Integrated Management Strategy (IMS) that will enhance sustainable use of protective agents against Med fly, sustainable management of environmental quality, production of safe, high-quality products, increased yield and income for the farmers;
- A simplified guidebook, which will present and describe the IMS to farmers in English, French, Greek, Hebrew, Italian, Spanish and Turkish, as well as other relevant Mediterranean languages;
- Evaluation of environmental indicators measuring the impact of the method;
- Risk analysis at the beginning and end of the project; and
- An impact report of the IMS on the socio-economic status of Mediterranean countries.

Development of an integrated strategy for reducing the carbon footprint in the food industry sector

Project background

The Greek food industry sector contributes a 25% share to the annual GDP. The pastry and flour sub-sector accounts for around 60% of food and drink companies in Greece, and the sub-sector is similarly important in Italy. Tackling the impact on climate change coming from this sub-sector can benefit not only strategic planning on GHG emission reductions at national and EU level, but it can also enhance competitiveness through increased efficiency in the use of energy, resources and applied logistics.

Project objectives

The main objectives of the LIFE FOODPRINT project are to evaluate the carbon footprint (CF) of the pastry and flour food industry sector along the production and supply chain, and to increase competitiveness through the development of an innovative software tool.

Specific project objectives are to:

- Develop a robust and easy-to-use software tool that will enable the reliable determination and evaluation of the CF of pastry and flour food products, considering direct and indirect activities (e.g. energy consumption, water and wastewater management);
- Perform a large-scale demonstration of the CF tool in six pastry and flour food companies in Greece and Italy, in order to evaluate the CF of a number of products along the supply chain, to identify the most critical steps in the supply chain that raise a product's CF and to develop mitigation programmes for each of the food companies and their products with suitable offsetting measures;
- Implement in one major pastry and flour food company in Greece and in one in Italy the CF offsetting programme of measures, derived from the analysis of the demonstration data;
- Introduce the first Greek and Italian company that has effectively lowered the CF of their products and successfully labelled them for the Greek and Italian markets;
- Develop a national strategy on the reduction of GHG emissions from the pastry and flour food industries in Greece and Italy, which will also enhance their competitiveness in the future; and
- Engage key stakeholders to ensure verification and promotion of results such as the uptake and wider use of the software tool and the labelling of food products with their CF.

LIFE13 ENV/GR/000958
LIFE FOODPRINT



Beneficiary:

Type of beneficiary

Large enterprise

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Duration of project:

38 months (01/09/2014– 31/10/2017)

Total budget in euro:

1,874,864.00

EC contribution in euro:

891,182.00

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Environmental management: Integrated management – Life Cycle Assessment- Management – Industry-Production: Food and Beverages

Expected results

Main project results include:

- Mapping of CO₂-equivalent emission sources of pastry and flour-related products;
- Development of a CF software tool;
- More than 100 products assessed for their CF, with corresponding CO₂ offsetting programmes and measures developed;
- More than 15% CF reduction potential for each pastry and flour product targeted, by applying the suggested offsetting programmes and measures;
- Development of national plans for Greece and Italy on CO₂ offsetting potential in the pastry and flour food sector; and
- More than 10% overall CO₂ offsetting potential for pastry and flour food sector at national level reached.

Innovative Real-time Monitoring and Pest control for Insects

Project background

Integrated Pest Management (IPM) is a sustainable approach to pest control that combines the use of prevention, avoidance, monitoring and suppression strategies to maintain pest populations below economically damaging levels. IPM can also minimise pest resistance and harmful effects of pest control on human health and environmental resources.

A previous LIFE project, MEDAPHON, developed a soil biological monitoring tool for continuous, automatic remote monitoring of soil microarthropods. The so-called EDAPHOLOG system is a novel, online, in-situ monitoring system consisting of opto-electronic probes, radio/internet data loggers and a central server. The EDAPHOLOG probes installed in the soil allow the remote sensing of soil microarthropod activities and current real-time data analysis via the EDAPHOWEB server application.

Project objectives

The INSECTLIFE project plans to further develop the EDAPHOLOG pest management tool and enable the system to detect pests and beneficial insects living in above-ground biotypes. The project aims to assemble the different CSALOMON® pheromone traps used for certain pest species and EDAPHOLOG sensors into a new construction. This would have the advantage of allowing detection of pest emergence and population changes in an immediate and automatic way, as the pheromone baits are pest-specific. EDAPHOLOG probe sensors inserted into CSALOMON® traps would detect only the targeted pest. Moreover, this automatic counting technique will provide much more accurate data for the growers than traditional manual counting methods.

Specific objectives are to:

- Manufacture a prototype of this system and test it under field conditions;
- Measure and demonstrate the substantial reduction of agricultural loads from use of the system;
- Provide insect population dynamics and pest forecasting by using local meteorological data measurements and forecasts; and
- Demonstrate the usefulness and environmental benefits in field trials at four pilot areas.

LIFE13 ENV/HU/001092
INSECTLIFE



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Miklós DOMBOS

Duration of project:

55 months (01/06/2014 – 31/12/2018)

Total budget in euro:

3,008,627.00

EC contribution in euro:

1,489,270.00

Themes: Environmental management: Cleaner technologies / Industry-Production: Agriculture – Fisheries / Risk management-Pollutants reduction

Expected results

- Development of ARTHROLOG prototype;
- Demonstration of 200 traps for air, ground and crawling insects. These traps are mechanical structures based on CSALOMON® pheromone traps;
- Demonstration of 200 different sensors including daylight sensors, capacitive sensors, CCD type sensors, IR opto-electronic sensors (that operate only in dark sensor field);
- Demonstration of 75 loggers that record and transmit data via SMS or the internet to the central server;
- Creation of a DATAWEB central database and web application;
- Evaluated findings from several years of field and demonstration tests covering four different sites (including orchards and arable land);
- Demonstration of the precision of the probes and the usefulness of the tool;
- Reduction in the use of pesticides in the project sites; and
- Demonstration of the overall system's cost efficiency.

Working with Industrial Spaces to Exemplify Reuse

Project background

The generation of municipal waste peaked in Ireland in 2007 at 3 397 683 tonnes and has since decreased slightly year on year. However, forecasts predict that the total amount of municipal waste generated in Ireland will increase by around 830 000 tonnes within the next 15 years. Landfill is still the main method of dealing with such waste, even though only about 11 years of capacity are estimated to remain. In 2009, 69% of recovered waste went abroad for reprocessing.

Project objectives

The main objectives of the WISER LIFE project are to reduce and re-use waste, divert it from landfill, create green jobs, reduce resource consumption, and improve access to innovative ecological education systems.

The project will build upon the activities of the project partners, in demonstrating best practice in waste re-use and preparation for re-use, as well as promoting physical, economic and social regeneration. The project's objectives will be achieved through the creation of an innovative centre demonstrating excellence in re-use at every level of interaction, supported by an eco-cluster of resource-efficient enterprises, and complemented by a suite of environmental education, training and research programmes.

Specifically, the project aims to:

- Create a prototype '3-D textbook' re-use education centre, to promote behavioural change, that not only embraces the concept of sustainable development but is, in itself, a teaching tool for sustainability;
- Present a new concept in educational space, incorporating active learning through building design, construction, operation and occupation;
- Demonstrate the potential of best practice waste re-use and preparation for re-use to assist in socio-economic regeneration at the EU level;
- Promote behavioural change with respect to waste generation, the use of natural resources, and recognising the value of waste; and
- Support the implementation of national and EU waste policy through operations, communications and education.

Expected results

- Prototype '3-D textbook' with integrated educational tools such as engineering trails, historical trails, performance feedback stations, viewing panels and galleries to promote behavioural change;

LIFE13 ENV/IE/000763
WISER LIFE



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Duration of project:

36 months (02/06/2014 – 01/06/2017)

Total budget in euro:

3,622,245.00

EC contribution in euro:

1,802,407.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Energy supply - Reduction of greenhouse gases emissions / Information-Communication: Environmental training - Capacity building / Waste-Waste reduction - Raw material saving - Waste use

- Eco-cluster of re-use social enterprises, initially comprising the current RDC activities of Rediscover Furniture, Rediscover Fashion, Rediscover Cycling and Rediscover Paint, demonstrating best practice in waste re-use;
- A suite of life-long learning programmes, directly impacting up to 4 500 people;
- Improved environment through the reduced and re-used waste, diversion of waste from landfill, reductions in resource consumption and awareness-raising;
- 25% of visitors to centre demonstrating behaviour change; and
- 50% reduction in energy consumed by buildings compared to predicted 'do-nothing' scenario modelling.

A novel manufacturing process for photocatalytically activate ceramic tiles by digital printing

Project background

Photocatalysis is a chemical reaction mediated by light, humidity and by photocatalysts, such as titanium dioxide (TiO₂). It plays an important role in the oxidation of pollutants, biological toxic agents, and volatile organic molecules. Surfaces coated with photocatalysts could therefore play an important role in improving air quality in indoor and outdoor environments.

The current ceramic tile coating process entails spraying a mixture of TiO₂ powder (micrometre and nanometre-sized particles), water and silica-based additives over the tile surface in a heating cycle (up to 680°C). Subsequently, the surface is brushed and washed with water, in order to remove excessive TiO₂ particles, and to achieve a homogeneous surface. This process involves the consumption of large quantities of water and energy, while about 70% of the TiO₂ powder is lost from input to final deposition. Although TiO₂ is chemically inert, recent studies suggest that TiO₂ nanoparticles may be potentially harmful for human health, especially for workers in close and prolonged contact with such powders.

Project objectives

The objective of the LIFE DIGITALIFE project is to demonstrate an innovative approach to the production of photocatalytic surfaces, by using digital printing technology. This represents an important paradigm shift for state-of-the-art TiO₂ coating processes.

The technology will be based on suitably designed print-heads, using an ink based on solvents, TiO₂, and additives (e.g. silicon-based powders to facilitate surface vitrification), able to coat a wide range of tile surfaces (up to 1.5 by 3 m). The TiO₂-based ink will be directly and homogeneously deposited on the tile surface, greatly reducing the quantities of TiO₂ used and disposed of as waste, while also drastically reducing energy and water usage. Moreover, the use of an innovative water-based ink instead of a solvent-based ink will further reduce the process' environmental impact. Finally, the solution will be validated and the project results widely disseminated in order to raise awareness of sustainable manufacturing, and of the positive environmental impact of eco-active tiles.

Expected results

Environmental results:

- About 12% energy saving (i.e. 0.004 kWh saving per m² of product), achieved by reducing the baking time necessary to dry the TiO₂-based coating;

LIFE13 ENV/IT/000140
LIFE+ DIGITALIFE



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Valentino CAPPUCCI

Duration of project:

42 months (01/07/2014 - 31/12/2017)

Total budget in euro:

2,930,845.00

EC contribution in euro:

1,323,568.00

Themes: Air and Noise: Air pollutants / Climate change – Energy: Energy efficiency - Energy saving - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies - Eco-products design / Industry-Production: Building / Risk management: Pollutants reduction / Water: Water saving

- 100% water saving (i.e. 260 g/m²) due to replacing the spraying technology with the digital printing technology;
 - Saving of at least 50% of TiO₂ (up to about 0.9 g/m²); and
 - Complete avoidance of petrochemical-origin solvent ink due to the use of an innovative water-based ink.
- Socio-economic benefits:
- 20% cost reduction and 15-20% reduction in baking time;
 - Availability of cost-effective and sustainable products that improve air quality;
 - Demonstration of a technology that avoids using potentially harmful nanometric powders, further pushing the market towards sustainable and safe solutions;
 - Reduction of the pressure on water resources; and
 - Reduction of TiO₂ waste and excess.

Naturalistic Restoration for the integrated hydraulic-environmental Sustainability of the Emilian Canals

Project background

Most European floodplains are crossed by a dense network of channels, created to protect areas from flooding and to enable the land to be used, typically for agriculture. Managed by land reclamation authorities, the channels facilitate the drainage of rainwater off the floodplain as well as storing water during the summer months for irrigation.

However, it is increasingly understood that these artificial works are one of the main causes of flood-related problems, including incidents of catastrophic damage. By altering a natural hydrographical network, such a system of artificial channels can impair the ability of a floodplain to cope with high water levels and periods of heavy rainfall.

Project objectives

The LIFE RINASCE project aims to reduce the risk of flooding and achieve good ecological status of the waters in the Po floodplain through ecological restoration of the channel network and vegetation management. It aims to demonstrate the feasibility, and environmental and socio-economic benefits of such measures on a large floodplain area.

The project plans to develop an integrated restoration programme for floodplain channels using river restoration methods and protocols for sustainable management of aquatic and riparian vegetation. The project will implement ecological restoration interventions on four different channels in the River Po floodplain. Interventions will include:

- The natural enlargement of a section of channel through excavation of a bank between two channels, which run side-by-side, to improve drainage;
- Enlargement of a natural channel for plumbing and water treatment plants to improve drainage;
- Lowering the floodplain and creating an arboreal strip of plants and shrubs to improve the ecological value in compatibility with hydraulic functions; and
- Creating a wetland to mitigate flood risks through water retention and to purify the water retained.

The project team will conduct physico-chemical, ecological, geo-morphological and hydraulic monitoring of the channel-restoration and vegetation-management interventions to demonstrate their effectiveness. It will also map the wider drainage area managed by the land reclamation authority to prepare future extension of the project's channel restorations and create operational guidelines for funding programmes.

LIFE13 ENV/IT/000169
LIFE RINASCE



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

Consorzio di Bonifica dell'Emilia Centrale

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Aronne RUFFINI

Duration of project:

54 months (02/07/2014 – 21/12/2018)

Total budget in euro:

2,076,390.00

EC contribution in euro:

941,390.00

Themes: Environmental management: Integrated management / Habitats: Freshwater / Risk management: Natural risks / Waste: River basin management

Expected results

- Restoration of a 7 km stretch of canals through the creation and/or the lowering of three hectares of floodplain areas and vegetation;
- Creation of 2 ha of wetland;
- Sustainable management of vegetation along one kilometre of channels;
- Integrated ecological, hydraulic and economic evaluations of the interventions;
- Improved ecological status of the channels and reduced flood events;
- Demonstration of the potential feasibility and benefits of the ecological restoration measures on a larger scale;
- Mapping of the wider drainage channel network; and
- Operational guidelines for specific funding programmes.

A novel and efficient sorting process for post-shredder ELVs to meet and overcome ELV directive targets

Project background

End-of-Life Vehicles (ELVs) are one of the most recycled consumer products. Nevertheless, part of the recovered material is still landfilled, some auto dismantlers and other ELV treatment facilities apply poor environmental practices and many vehicles are still abandoned. The environmental threat generated is large and likely to increase; ELVs in the EU are expected to reach 14 million tonnes by weight in 2015.

The recycling chain of ELVs starts with the removal of the vehicle's re-usable parts. Then the ELVs are sent to wreckers for shredding, in which metals are magnetically removed and recycled. The remaining 15% of material is mostly landfilled.

To encourage a life-cycle approach, the EU's ELV Directive (2000/53/EC) establishes that vehicle manufacturers are responsible for their products until their complete disposal. Furthermore, all vehicles have to be 95% recoverable and 85% recyclable by 2015. Few EU countries are close to meeting the 95% recovery target.

Project objectives

The LIFE CARWASTE project aims to contribute to the effective life-cycle management of cars through an innovative process to exploit currently landfilled waste material. Specifically, it plans to develop and demonstrate an innovative technology and process to facilitate the re-use of 'fluff' materials in cement and steel plants.

The project will construct a pilot plant that aims to finely separate small shredded car waste materials of 1.5-70 mm. It thus expects to be able to recover and recycle its component materials. It aims to demonstrate the feasibility of using recovered materials for the production of high-quality fuel for cement and steel plants, meeting EU regulations on standards for solid recovered fuels. The project will undertake a thorough life-cycle and cost-benefit analysis of the new process. It aims to demonstrate that the plant is replicable, scalable, affordable and sustainable.

Expected results

- A pilot plant able to separate thin shredded materials from ELVs at a capacity of around 3.5 tonnes/hour scrap from ELV demolition;

LIFE13 ENV/IT/000185
LIFE CARWASTE



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

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Name of contact person

Giuseppe PINESE

Duration of project:

43 months (01/06/2014 – 31/12/2017)

Total budget in euro:

2,346,103.00

EC contribution in euro:

1,094,237.00

Themes: Climate change – Energy: Energy supply / Waste: End-of-Life Vehicles (ELV's) and tyres - Waste recycling

- About 34% of car fluff – amounting to about 5 355 t/year of ELV material – recovered and exploited for energy production in the cement and steel industries, meeting the appropriate standards for recycled fuel:
 - Contaminants produced per kg under the thresholds defined in the CEN/TC 343 'Solid recovered fuels' standards; and
 - Metals emitted under the limit of 0.5 mg/Nm³ as set by the Directive 2010/75/CE on industrial emissions.
- Demonstrate the technical and economic feasibility, environmental benefits, scalability and transferability of the pilot module;
- Provide an affordable and sustainable business model for the transferability of the module to other facilities; and
- Contribute in the long term to the achievement of ELV recycling targets – and associated avoidance of land-filling of ELV waste.

GIOCONDA: i GIOvani CONtano nelle Decisioni su Ambiente e salute - Youth counts in decisions on environment and health

Project background

Reducing the burden of diseases associated with environmental health risks is a European priority. In 2004, during the fourth ministerial conference on environment and health, the Children's Environmental and Health Action Plan for Europe (CEHAPE) was drafted. This set regional priority goals for European countries to reduce and, where possible, eliminate children's exposure to environmental health risks. The priority of protecting children from environmental pollution was also part of the Parma Declaration signed in 2010. These documents emphasise the importance of involving young people in decision-making processes; encouraging the creation of participative tools for the development of environmental and health indicators; and implementing initiatives on the perception of risk, its assessment, management and communication.

Project objectives

The main objective of the LIFE GIOCONDA project is to provide local authorities with an innovative methodology that can effectively support policies on the environment and health, by involving young people in decision-making processes.

Data relating to air and noise pollution will be collected in four project cities: Napoli, Taranto, Ravenna and Valdarno. This will be combined with data assessing the risk perception of teenagers, and their willingness to pay for local services related to environmental health issues. The project will develop and test an online platform to facilitate the application of environmental and health risk governance and policies. The platform will include a tool that allows decision makers to estimate costs and benefits of policies involving air pollution and/or noise exposure reductions that target young people's health, and a tool that enables schools to measure the pupils' perception of their surrounding environment.

Expected results

- Online platform with two distinct tools (to support knowledge-based and local environmental health policies);
- Platform made available to decision makers and to a wide range of professional figures at both national and local levels, including local authorities, schools, civil society (e.g. environmental associations, medical associations, parents' associations and youth councils);

LIFE13 ENV/IT/000225
LIFE GIOCONDA



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

Institute of Clinical Physiology - National Research Council

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Liliana CORI

Duration of project:

30 months (02/06/2014 – 30/11/2016)

Total budget in euro:

1,391,641.00

EC contribution in euro:

687,612.00

Themes: Air and Noise: Air quality monitoring – Noise / Information-Communication: Awareness raising – Information - Public and Stakeholders participation / Risk management: Human health protection

- Platform used by four partner municipalities and tested by at least two further municipalities;
- Eight schools and their local administrations, plus about 650 students, 650 parents, around 30 teachers, and at least 50 stakeholders including policy-makers involved in project activities; and
- At least 2 000 stakeholders reached and informed about the project's outcomes.

HF - Free electrolytic pickling system for stainless steel tubes

Project background

Nearly all the pipes produced in the EU require one or more cycles of electrolytic treatment ('pickling') during the production process. Mixtures of hydrofluoric (HF) and nitric acids are traditionally used, in quantities varying between 15 and 50 g/l, at temperatures between 25°C and 55°C.

The gradual introduction of processes not involving nitric acid has considerably improved air quality, by reducing pollutants in effluents; but these have not reduced quantities of HF acid used or the working temperatures. In particular, the production and management of HF acid raises concerns related both to human health and the environment.

A standard pipe-producing plant needs large amounts of concentrated HF, but accidental HF leaks, uncontrolled emissions and high transportation costs represent a significant burden for the companies involved, considering that HF acid and its solutions are classified as H1 (acute toxic category 1) and H2 (acute toxic category 2) in the EU Directive 2012/82/EU on chemical accidents.

Project objectives

The HFree Life Pickling project aims to develop a new process of electrolytic pickling for duplex and special stainless steel, welded and seamless pipes. The process should be comparable in outputs with current chemical pickling, but it should not require HF, other acids, or other toxic or harmful substances. It will also reduce the treatment time.

This process should represent an industrially viable alternative to chemical pickling. The project will identify and optimise an electrolytic process, based on applying direct current to the material to be pickled, immersed in a specially conceived electrolytic solution that contains no acids. It will identify parameters for the application of current and find the most suitable electrolyte with the lowest environmental impact, while reaching the same quality levels as the existing chemical pickling.

Expected results

- A new product, the electrolyte, consisting of a fluid not containing HF acid or other highly toxic substances, which can be used with the application of electricity for pickling steel;

LIFE13 ENV/IT/000440

HFree Life Pickling



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Matteo BULLA

Duration of project:

36 months (01/07/2014 – 30/06/2017)

Total budget in euro:

1,492,614.00

EC contribution in euro:

701,081.00

Themes: Air and Noise: Air pollutants / Environmental management: Cleaner technologies / Industry-Production: Metal industry / Risk management: Industrial risks - Hazardous substances - Pollutants reduction

- A new process, entailing a new treatment solution and a pilot plant or application system, ready for implementation of the electrolytic pickling treatment on an industrial scale;
- A series of guidelines to define the operating conditions and variables of the process;
- A significant reduction in the environmental impact of the pickling process, due to the complete elimination of HF acid and related emissions, with a consequent reduction in indirect risks associated with air pollutants, waste disposal and potential accidents;
- A significant reduction in the pickling times of the semi-finished and finished products with similar composition and oxide content (at least 70% with respect to current HF solutions);
- Reduced energy consumption, due to lower temperatures and treatment time; and
- Surface finish up to sector standards.

Environmentally friendly biomolecules from agricultural wastes as substitutes of pesticides for plant diseases control

Project background

Plant diseases caused by bacteria and nematodes often result in sudden and devastating financial losses to farmers, and are extremely difficult to control. Similarly, plant-parasitic nematodes are responsible for heavy crop losses (up to 12%) and the diseases they cause are difficult to control.

Traditionally, nematode-related diseases have been managed with the utilisation of plant resistance, crop rotation, biological control, and cultural practices. However, farmers have always preferred using pesticides, which can have severe environmental effects. Presently, most nematicides are not included among the labelled agrochemicals for crops under good agricultural practices because they belong to high-risk classes. Moreover, the development of resistance phenomena and the potential for adverse ecological impact from nematicides creates a continuous need for new products and alternative control strategies for these plant parasites.

Project objectives

The main goal of the LIFE EVERGREEN project is to demonstrate the efficacy and reliability of polyphenol-based biomolecules recovered from agricultural non-food biomass and wastes as disease-control products against phytopathogenic bacteria and nematodes. The aim is to use these novel compounds to replace current commercial pesticides and the application of copper salts in conventional and organic agriculture. Trials to optimise field treatments will be carried out on several plants and crops having a high commercial value, which will be used as models (e.g. olive, kiwi, potato and tobacco).

Specific project objectives are to:

- Use polyphenol-based molecules extracted from agricultural plant biomass and by-products for the control of bacterial and nematode diseases of crops, in order to replace or reduce usage of conventional pesticides in accordance with EU legislation;
- Optimise specific polyphenolic formulations against several plant pathogenic bacteria and nematodes; and
- Adopt an eco-friendly, cost-effective and integrated approach for the control of bacterial and nematode diseases of plants, based on the sustainable use of renewable resources.

LIFE13 ENV/IT/000461
LIFE EVERGREEN



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Stefania TEGLI

Duration of project:

24 months (01/10/2014 - 30/09/2016)

Total budget in euro:

1,273,407.00

EC contribution in euro:

631,747.00

Themes: Environmental management: Cleaner technologies / Industry-Production: Agriculture – Fisheries / Land-use and Planning: Soil and landscape protection / Risk management: Pollutants reduction

Expected results

- Long-term reduction of pollution in agricultural soils due to the replacement of conventional pesticides used against plant-pathogenic bacteria and nematodes;
- Increased effectiveness by 55% of the control of the bacterial and nematode diseases of plants through the wider temporal application of polyphenol-based bioactive molecules, given that plants can be treated during periods when conventional pesticide treatments are not allowed;
- Reduced costs for disposal of agricultural non-food vegetable biomass and waste by 45%;
- Reduced energy consumption used for remediation processes of pesticide-contaminated soils by 20%;
- Improved soil fertility by 70%; and
- Increased soil microbial diversity by 65%, with positive impact on soil biology and on the transformation and dynamic of nutrients.

Environmentally friendly natural products instead of chemical products in the degreasing phase of the tanning cycle

Project background

In the EU, about 235 000 tonnes of leather are produced annually, with Italy and Spain the main producing countries.

Products of petrochemical origin, and in particular chlorinated compounds, have been widely used in the leather defatting process. They are preferred mainly because of their chemical stability, low cost and good performance. However, there is an increasing concern for their high chlorine content and low biodegradability potential. Replacing these products with new natural derivatives from vegetable oils could avoid significant environmental problems.

Project objectives

The LIFE ECODEFATTING project aims to demonstrate the feasibility of using innovative environmentally friendly products for the defatting phase of the leather tanning process. It thus aims to contribute to a more environmentally sustainable development of the leather industry.

The project aims to replace toxic chemical products with natural products from renewable sources. It will specifically avoid the use of defatting agents which contain chlorinated molecules and favour the transformation of chromium III into chromium VI during the disposal of waste leather and used leather articles. It aims to identify natural defatting products that penetrate better into the derma of the leather, giving better performance.

The project aims to reduce the contamination levels in wastewater from the tanning sector. It will study biodegradability processes to ensure that more biodegradable defatting products can be used, which will make it easier to implement biological wastewater treatments. This will mean both savings in the consumption of chemicals for purification – coagulants, flocculants, etc – and less generation of sludge. The project seeks to improve the environmental impact of leather goods over their life-cycle.

Expected results

- Replacement of all petrochemical products with natural products, based on renewable sources for the defatting phase of the tannery process;
- Six new tanning formulations for the defatting phase, containing six different natural products based on glycerol diacetate products and derivatives;
- Laboratory production of 100 innovative samples making use of natural products;

LIFE13 ENV/IT/000470
LIFE ECODEFATTING



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Massimo CORSI

Duration of project:

24 months (01/10/2014 - 30/09/2016)

Total budget in euro:

1,035,556.00

EC contribution in euro:

517,778.00

Themes: Environmental management: Cleaner technologies / Industry-Production: Leather and Footwear / Risk management: Industrial risks - Hazardous substances - Pollutants reduction / Water: Water quality improvement - Water saving

- Tanning of 50 sheep/goat skins and bovine leathers using the natural products in the defatting phase;
- Production of 100 leather goods, using the natural products for the defatting stage, and all manufactured in compliance with the European Eco-label criteria;
- Elimination of the presence of chlorinated molecules from the defatting phase;
- Elimination of the chlorinated functional group in the defatting phase; and
- Laboratory analyses in order to check the following:
 - Fewer (20%) pollutants in bath wastewaters;
 - Reduction (20%) of water consumption during the tanning process;
 - Reduction (20%) of polluting load in tannery waste water; and
 - Toxicity reduction of high chlorine in the tanning cycle (100%).

Prototyping of Recycled Plastic Conveyor Belt Machine and Demonstration of Recycled Plastic Tight tolerance Applications

Project background

Around 3 500 tonnes of light-duty conveyor belts are produced in Europe each year. These are usually made of PVC, synthetic rubber or virgin plastic. Rubber belting represents 25% and PVC represents 60% of the total amount required each year – around 850 tonnes of synthetic rubber and 2 100 tonnes of PVC.

The irreversible cross-linking between polymer chains means that the rubber from conveyor belts cannot be formed again into belting – although other recycling possibilities do exist. Thermoplastics such as PVC can, in principle, be melted and reprocessed more than once. However, compared with materials such as glass and metal, plastic polymers require greater processing to be re-used.

Project objectives

The LIFE REPLACE BELT project aims to develop a new conveyor belt made entirely of recycled plastics. It thus aims to deliver an innovative product that completely substitutes materials with a large environmental footprint with 100% recycled material.

The project will develop a modular conveyor belt made out of recycled plastics. It will test the product for tensile strength and demonstrate its successful application in moving parts. It targets a market share of 15% for the new product.

The project also aims to deliver a more energy efficient process than standard conveyor belt production. It will specifically focus on reducing energy consumption during injection moulding.

Additionally, the project will investigate further applications of recycled plastics, such as the use of snap-fit and hooking design to introduce recycled plastic into the production process of waste containers. It will also produce a waste management plan and implement a new hard plastic urban waste collection. This will both increase sources for recycled plastics and further reduce the volume of bulky plastics going to landfill.

Expected results

- Development of a modular recycled plastic belt with a target tensile strength of 14.5 N/mm;
- Achievement of 15% market share with the recycled plastics light conveyor belt;
- Demonstration of new successful applications for recycled plastics;

LIFE13 ENV/IT/000477
LIFE REPLACE BELT



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

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Manuela BROTTTO

Duration of project:

36 months (01/07/2014 – 01/07/2017)

Total budget in euro:

1,554,518.00

EC contribution in euro:

736,634.00

Themes: Climate change – Energy: Energy efficiency
– Energy saving – Reduction of greenhouse gases emissions / Industry-Production: Plastic – Rubber – Tyre / Waste: Waste recycling – Waste reduction – Raw material saving – Waste use / Water: Water saving

- Reduced consumption of virgin thermosets and thermoplastic by about 1.6 t/yr, of which 70% PVC, 20% synthetic rubber and 10% thermoplastics (PP);
- Reduced energy consumption during injection moulding by up to 40% during the project's lifetime;
- Reduced energy footprint of the production process by 37% over pre-project years, amounting to a saving of about 23.2 MWh/yr;
- Reduced production-and-processing CO₂ footprint by 44% over pre-project years, amounting to about 3.8 t/yr;
- Reduced crude oil consumption for the production of plastics by 71%, amounting to 12 barrels of crude oil saved;
- Reduced water consumption by 71%, amounting to 2 500 cubic meters of water saved;
- Increased amount of bulky, rigid plastics diverted from landfill to 75%; and
- A new hard plastic urban waste collection system.

Phthalates and bisphenol

A biomonitoring in Italian mother-child pairs: link between exposure and juvenile diseases

Project background

Bisphenol A (BPA) and di-2-ethylhexyl phthalate (DEHP) are two environmental endocrine disruptors (EDs) which – despite being non-persistent chemicals – are regularly detected in the environment, in food and, as a consequence, in humans. This is due to their continuous release from manufacturing or processing facilities despite restrictions imposed by law.

BPA is used in the production of plastic polycarbonate and epoxy-phenolic resins for non-food and food applications. It has been shown to migrate in small amounts into food and beverages, with children as the most exposed population. DEHP is mainly used as plasticiser in polymer products, and in some food and cosmetics packaging and medical equipment. It then enters the environment, mainly after disposal, via direct release to the air, from sewage sludge and solid waste.

Project objectives

The LIFE PERSUADED project aims to increase knowledge and understanding of both the levels of DEHP and BPA in children and their mothers, and the links between exposure to these EDs and developmental and health problems in children. It aims to contribute to reduced exposure and reduced risks from EDs.

The project will estimate internal levels of DEHP metabolites and BPA among children and their mothers. It will define reference ranges for DEHP and BPA exposure among Italian women and children according to their residence area. It will specifically evaluate differences in exposure between ages, genders and urban and rural areas in Italy. It will also use structured questionnaires to investigate which environmental characteristics, food habits and lifestyles are likely sources of ED exposure.

To assess the risks associated with ED exposure, the project will investigate the relationship between internal levels of DEHP metabolites and BPA and developmental issues in children. It will also evaluate the developmental effects of BPA/DEHP exposure in experimental conditions through a juvenile toxicity study in rodents. The project aims to enable better risk assessment of BPA and DEHP exposure.

Expected results

- Data on DEHP and BPA exposure among children and mothers;

LIFE13 ENV/IT/000482
LIFE PERSUADED



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Cinzia LA ROCCA

Duration of project:

43 months (01/09/2014– 31/03/2018)

Total budget in euro:

1,866,398.00

EC contribution in euro:

877,658.00

Themes: Information-Communication: Awareness raising – Information / Risk management: Human health protection - Industrial risks - Hazardous substances - Risk assessment and monitoring

- Information on the relative risks of DEHP and BPA exposure according to age, gender and residence area;
- Information on environmental characteristics, food habits and lifestyles as sources of ED exposure;
- Data on DEHP and BPA exposure and postnatal development in rodents;
- Risk assessment of developing premature thelarche (breast development), precocious puberty and juvenile obesity from ED exposure;
- Biomonitoring equivalents (BE) for BPA and DEHP as a tool to support risk management;
- HBM1 and HBM2 reference values;
- Definition of a panel of biomarkers specifically correlated to BPA/DEHP human exposure and health status;
- Assessment of the reliability and sensitivity of the panel of biomarkers selected in controlled studies; and
- Identification of effective measures to reduce exposure.

Cementitious Brake Control

Project background

Production of fine Particulate Matter (PM) in the road transport sector represents a high risk factor for health. The fine (PM_{2.5}) and ultrafine (PM_{0.1}) particles are particularly hazardous. Despite efforts to reduce GHGs and exhaust emissions, PM limits are widely exceeded across the EU.

Brake systems have only recently been considered as a source of PM emissions by European authorities. It is estimated that 21% of the PM emitted by cars is PM₁₀ from brake wear. Brake wear particles contain several toxic elements that may have adverse health effects, such as metals and harmful volatile organic compounds (VOCs).

In parallel, the use of phenolic resins in the manufacturing of brake pads has significant environmental effects. These include high energy consumption and related CO₂ emissions, high water consumption, and VOC emissions, which affect the health of workers in the sector. Phenolic resins are the main component and about 30% by volume of brake pads.

Project objectives

The LIFE+ COBRA project aims to demonstrate a novel brake pad technology, based on the use of cement instead of phenolic resins. It aims to reduce emissions of harmful chemicals and PM from the production and use of brake pads, while maintaining braking performance compared to conventional technologies.

The project plans to build and start up two pilot lines for the production of brake pads. Through the replacement of phenolic resins with cement materials, it aims to significantly reduce water and energy consumption and eliminate the generation of secondary ultrafine PM and VOC emissions during the production process.

The lines will be used to manufacture prototype brake pads with different cement compositions. The project aims to show that it can achieve important reductions in emissions of PM and harmful chemicals in the braking process, while maintaining braking performance.

The team will monitor, test, fine tune and validate the lines and prototype brake pads. They will particularly monitor relevant toxicological and environmental indicators throughout the action. They will conduct in-silico and in-vitro toxicological analyses and a Life Cycle Analysis to assess the environmental impact of the project with a cradle-to-grave approach.

LIFE13 ENV/IT/000492

LIFE+ COBRA



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Andrea GAVAZZI

Duration of project:

45 months (01/07/2014 – 31/03/2018)

Total budget in euro:

3,825,529.00

EC contribution in euro:

1,483,911.00

Themes:

 Air and Noise: Air pollutants / Climate change

– Energy: Energy efficiency - Energy saving - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies - Eco-products design / Industry-Production: Engines - Machinery – Vehicles / Risk management: Pollutants reduction

Expected results

Environmental benefits during the production process:

- About 85% energy saving (6 MJ/kg of cement), and thus a consistent reduction in CO₂ emissions;
- 95% water saving; and
- Up to 100% elimination of emissions of VOCs and PM 0.1.

Improved environmental performance of brake pads:

- 100% reduction of harmful chemicals during braking processes; and
- Significant reductions in PM emissions during the braking process.

There will also be reduced impact and societal costs of health problems related to PM exposure from vehicles.

Sustainable recycling in polyvalent use of energy saving building elements

Project background

Heterogeneous glass-based waste is a growing problem in Europe. Properly sorted, the waste can be re-melted to produce new glass products, or for use in secondary markets, including in the production of ceramics, insulation materials and concrete. However, around 25% of waste glass still ends up in landfill sites, mainly because most current markets require relatively pure recycled glass. New products and uses for waste glass are needed, which are not sensitive to contaminants in the glass or different colours in unsorted glass.

Project objectives

The overall objective of the LIFE in SustainaBuilding project is to demonstrate an effective process for using various waste materials, including unsorted glass waste. It specifically aims to recycle this waste to produce innovative construction materials – such as bricks, panels, wall coverings, and internal and external flooring.

The project plans to set up a demonstration production line for the valorisation of various waste materials that are currently sent to landfill. The process will use glass mixtures with a high percentage of waste materials, regardless of their colour or contamination level. These will include silica vitreous phases (dusts from steelworks and heterogeneous glass from different production sectors) and reactive blowing agents (carbonates, carbides or compounds containing carbon residue and food industry processing residues) or space holders (sodium chloride).

The technology will entail the application of a reactive sintering production cycle at temperatures under 750°C, to obtain material for the production of innovative construction materials for use in high-performance buildings, in terms of weight and thermal insulation. The innovative input mixture and low temperature sintering method will make it possible to obtain these high-performance products in a very short time - maximum 30 minutes - with significant energy savings.

Expected results

- Recycling of three cubic metres of waste per day (also contaminated with salts or ceramic materials);
- Reduction of unsorted glass waste sent to landfill;
- A new product consisting of at least 90% waste;
- A low temperature production cycle, ensuring a low embodied energy (about 5 MJ/kg) and an energy saving of about 30%;

LIFE13 ENV/IT/000535
LIFE in SustainaBuilding



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

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Fabio RAIMONDI

Duration of project:

30 months (01/08/2014 – 31/01/2017)

Total budget in euro:

1,803,583.00

EC contribution in euro:

884,690.00

Themes: Climate change – Energy: Energy efficiency – Energy saving – Reduction of greenhouse gases emissions / Environmental management: Eco-products design / Industry-Production: Building / Waste: Construction and demolition waste – Waste recycling

- A low weight end product (apparent density of between 0.4 and 1.2 g/cm³);
- Low thermal conductivity of the product (between 0.16 and 0.21 W/m K);
- A product with a compressive strength that makes it suitable for structural applications with low loads (at least 2.7 MPa);
- The new product will be obtained in a very short time (max. 30 minutes);
- The new product will be much safer than rock fibre or glass fibre panels;
- The new product will be completely recyclable at the end of its life; and
- It will be possible to stain the new product with natural colours or to have it superficially coloured, also with glazes.

Intelligent system to implement smart functions on gas networks to mitigate the greenhouse effect by reducing gas leaks

Project background

To meet the EU objective of an overall 8% reduction in its greenhouse gas (GHG) emissions from 2008 to 2012 – in accordance with the Kyoto Protocol – each Member State was required to apply a cap-and-trade type system to their industrial sectors that overall generate 40% of the GHG emissions in the EU. At the end of 2008, the EU strengthened its commitment by adopting a new strategy, the 20/20/20 targets.

Gas leaks are not only a waste of resources, but also an important contributor to GHG emissions. Scientific evidence has shown that losses of methane and carbon dioxide – the GHGs contained in natural gas – are directly proportional to network operating pressure. This quantity is kept constant at an over-dimensioned value with the current operating method.

Project objectives

The LIFE GREEN GAS NETWORK project aims to demonstrate the applicability of a new management and control system to regulate pressure levels in natural gas distribution networks. It aims thus to achieve a reduction of GHG emissions resulting from gas leaks from the system of at least 3%.

The project will develop a new management and control system, including new devices for measuring and regulating pressure in natural gas distribution networks. It will implement new software to manage remote communication between devices on the network and a control centre to process data in real time to optimise pressure on each branch of the network.

The project aims to demonstrate successful implementation of the new management and control system on a working natural gas distribution network. It expects to be able to maintain pressure above a minimum threshold at all times across the tested network and guarantee that off-peak pressure is lower than current values.

The team will test the system with all kind of pipes, including steel and polyethylene. By achieving more regulated pressure levels in the system, the project aims to reduce gas leaks by at least 3%. It also expects to show maintained or improved service quality levels compared with the current management method and demonstrate compliance with all relevant safety standards.

LIFE13 ENV/IT/000536
LIFE GREEN GAS NETWORK



Beneficiary:

Type of beneficiary

International enterprise

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Duration of project:

36 months (01/06/2014 – 31/05/2017)

Total budget in euro:

1,574,763.00

EC contribution in euro:

723,631.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Energy supply - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies / Risk management: Pollution control

Expected results

- Develop and implement a new automated pressure regulation system for natural gas distribution networks;
- A pressure level in natural gas distribution networks that is never less than 18 mbar at all delivery points on the tested network portion;
- Off-peak pressure values that are significantly lower than current constant values – both on medium pressure (MP) and low pressure (LP) – of the network;
- Reduction of no less than 3% in physical gas leaks, and hence GHG emissions;
- The total amount of gas recovered from the network test portion equivalent to 467 CO₂ TEQ; and
- Compliance with the safety standards required by the EU Directive 94/9/EC on equipment and protective systems.

Induction oven with rotating permanent MAGNets for energy efficient aluminium HEATing

Project background

The manufacturing of non-ferrous metals – such as aluminium (Al) – is an important part of the European industrial value chain. Current production of extruded Al in Europe is about 3 Mt/year.

However, Al production poses important environmental concerns around high energy consumption, GHG emissions and climate change effects. The Al industry in Europe has an overall energy consumption of 1 150 GWh/year and produces around 0.6 Mt/year of CO₂ emissions.

Productivity, quality and energy consumption in Al extrusion strongly depend on metal heating techniques. New generation gas burners are providing more energy efficient alternatives through the recovery of enthalpy heat of the fumes. However, this tends to create increased emissions of nitrogen oxides that can cancel out the reductions in CO₂ emissions from the energy savings.

Project objectives

The MAGNHEAT-LIFE project aims to demonstrate the first full-scale industrial application of a novel concept of direct current (DC) induction heating furnace for Al extrusion. The project hopes this innovative technique can be shown to be a Best Available Technique (BAT) for the non-ferrous metal sector.

The project will design, build and test an industrial-scale prototype of a DC induction heating system using rotating permanent magnets. It expects to demonstrate the technical feasibility of the new application, delivering significant reductions in the time needed for metal extrusion and a particularly high degree of control of temperature distribution in the process.

By reducing the time taken and enabling customisation of the billet heating – depending on the specific application or material needed – the prototype should provide increased efficiency of production and significant reductions in energy consumption and associated CO₂ emissions. The project will conduct environmental-impact and thermo-economic assessments to prove its environmental and economic benefits.

On a wider scale, the project aims to contribute to the strengthening of environmental policy and legislation on Italian industry.

LIFE13 ENV/IT/000538
MAGNHEAT-LIFE



Beneficiary:

Type of beneficiary

International enterprise

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Duration of project:

30 months (01/07/2014 – 31/12/2016)

Total budget in euro:

1,982,257.00

EC contribution in euro:

990,409.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies / Industry-Production: Metal industry

Expected results

- A technically feasible DC induction heating furnace with expected power of 700-1 000 kW and 5-10 t/hour of Al billets heating capacity (industrial scale);
- Improved technical performance compared to AC induction or gas ovens, particularly:
 - increased flexibility in operational parameters;
 - reduction of up to 30% in the time needed for metal extrusion;
- Energy savings of 50% compared to the current new generation gas burners with classical AC induction taping;
- Reduction by 50% of associated CO₂ and other air pollutant emissions;
- Relatively low investment costs – economic feasibility;
- Potential long-term inclusion as a BAT in the updated BREF for the non-ferrous metal sector; and
- Contribution to national and European industrial energy efficiency efforts.

Recycling of special plastic waste from the automotive industry

Project background

One of the waste streams emerging from the treatment of end-of-life vehicles (ELVs) is the waste tanks and reservoirs from fuel and cooling systems. Most of the hydrocarbons are adsorbed during the life of the tanks and the waste treatment process further reduces the original mechanical properties. Collected material cannot thus be used for most of the specific applications it previously had.

As a result, most decommissioned tanks are currently sent to landfill, or to plants that incinerate waste for the production of thermal and electrical energy. To achieve the recycling of these materials, an innovative recovery process is needed that would leave a secondary raw material with chemical and technological properties that allows it to be re-used in the normal production cycles.

Project objectives

The AUTOPLAST-LIFE project aims to develop a system for the recovery and recycling of special plastic waste from the automotive sector. The system will include a network for the selective collection of vehicles' waste tanks and reservoirs, as well as a pilot recycling plant to generate recyclable secondary material.

The project will design, construct and start up a large-scale industrial plant for treatment of waste tanks and reservoirs from the recovery and recycling of ELVs. The plant will granulate the special plastic waste for transformation into material with the chemical and technological properties appropriate for recycling.

Innovative techniques will include replacing commercial additives with sodium bicarbonate (NaHCO_3) to provide better hydrocarbon adsorption performance and the use of finely-ground coffee dregs – obtained from business activities – for odour neutralisation of the tanks' cleaning waters and the adsorption of a fraction of hydrocarbons. These techniques will significantly reduce processing costs for the recycled fraction.

The project will create a network responsible for the collection, selection and recovery of special plastic waste from ELVs in the Italian province of Brescia. The network will include large and small waste collection centres and the active involvement of social co-operatives in the recovery, selection and separation of the ELV wastes.

LIFE13 ENV/IT/000559
AUTOPLAST-LIFE



Beneficiary:

Type of beneficiary

Large enterprise

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Duration of project:

48 months (01/06/2014 – 31/05/2018)

Total budget in euro:

4,438,972.00

EC contribution in euro:

1,230,048.00

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Industry-Production: Engines - Machinery – Vehicles / Waste: End-of-Life Vehicles (ELV's) and tyres - Packaging and plastic waste - Waste recycling - Waste reduction - Raw material saving

The project will also explore new commercial networks for valorisation of the re-usable material generated.

Expected results

- Development and organisation of a supply chain of special plastic waste from ELVs in Brescia,
- A large-scale industrial plant for the transformation of the collected plastic waste into re-usable material;
- Recovery and granulation of around 200 tonnes of plastic materials from tanks;
- Reduction of processing costs for the waste fraction by 25 times;
- Use of the regenerated granules in place of virgin raw materials generating economic benefits and a decrease of CO_2 emissions; and
- Commercial exploitation of the regenerated granules.

Introducing innovative precision farming techniques in AGRiculture to decrease CARbon Emissions

Project background

It is widely recognised that the primary sector has significant potential to mitigate climate change, given that it has been responsible for around a third of all carbon emissions since 1850 from land use. Though agriculture in the EU accounts for only about two per cent of GDP and five per cent of employment, it is responsible for 45% of total land use and 9.6% of total greenhouse gas (GHG) emissions (according to figures for the EU-27 in 2008).

Project objectives

The overall goal of the LIFE-AGRICARE project is to demonstrate that the introduction of new integrated agriculture applications, incorporating precision farming technologies, have significant potential in terms of energy saving and GHG reductions.

Specific objectives are to:

- Test and demonstrate, in four different crop systems, the GHG mitigation potential of five types of new electronic and mechanical machines for minimum tillage and sustainable soil management;
- Compare innovative types of equipment for precision farming with traditional types, to benchmark their effective potential for energy saving and GHG mitigation;
- Analyse the barriers to the diffusion of new techniques in different Italian rural areas and to assess the economic convenience for farmers of introducing advanced precision farming systems, taking into account the driving forces towards changes (e.g. increasing yields, energy reductions and overall economic benefits);
- Evaluate, using modelling systems and GIS analysis, the long-term effects of technology introductions upon climate change patterns in agriculture, as well as defining the Italian rural surfaces that are most suitable for the introduction of the tested technologies; and
- Introduce on a large scale low-emission, precision farming techniques, along with agro-environmental indicators, by implementing a technology transfer strategy.

Expected results

- Conducting of 83 trials for low-carbon farming;
- Benchmarks for the mechanical operations, in terms of plant growth, yield, soil characteristics, energy and CO₂ consumption;
- Three comparative assessments completed, concerning plant production for each crop management

LIFE13 ENV/IT/000583
LIFE-AGRICARE



Beneficiary:

Type of beneficiary

Development agency

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Duration of project:

36 months (01/06/2014 – 31/05/2017)

Total budget in euro:

2,577,825.00

EC contribution in euro:

971,480.00

Themes: Climate change – Energy: Energy efficiency – Energy saving – Reduction of greenhouse gases emissions / Industry-Production: Agriculture – Fisheries / Information-Communication: Environmental training – Capacity building / Land-use and Planning: Soil and landscape protection

technique, emissions and energy consumption, GHGs during the trials, and economic benefits delivered;

- A model simulation of the long-term effects of new crop systems on carbon storage, GHG emission from soils and nitrogen balance;
- Report comparing the different technological solutions tested from the point of view of long-term soil carbon content;
- An evaluation analysis of the Italian arable land surfaces that could be suitable for the diffusion of new tillage and management techniques;
- Online tool for farmers for the self-assessment of the environmental impacts of innovative techniques in terms of GHG emissions; and
- Evaluation of carbon market benefits showing the potential effects of tested technologies in providing meaningful carbon credits.

BIOCOPAC: Sustainable bio-based coating from tomato processing by-products for food metal packaging

Project background

Lacquers for foodstuff packaging mainly consist of petroleum derivatives, with epoxy resin being the most widely utilised component. The use of a petrol-based lacquer increases the carbon footprint of a packaging company by 0.4% for each kilogramme of metallic cans produced; 90% of this impact is linked to the production of the epoxy resin that causes 3.31 g of CO₂ emissions per kilogram of cans.

Some efforts have already been made to introduce into this process components or additives from renewable sources. For example, the LIFE BIOCOPAC project aimed to develop a natural lacquer from tomato processing by-products for application on the internal and external surfaces of cans for foodstuffs, among other uses.

Project objectives

The LIFE BIOCOPACPlus project, a follow up to the BIOCOPAC project, aims to demonstrate the technical feasibility and the effectiveness on an industrial scale of the production of a bio-lacquer obtained from the re-use of tomato waste (i.e. skins) – the lacquer will serve as a coating for food contact applications in metal cans.

Specifically, the project aims to:

- Give value to tomato industry by-products, by offering alternative strategies for waste re-use and minimisation in accordance with the Waste Framework Directive (2008/98/EC);
- Design and scale up a prototype processing plant for the extraction of cutin from tomato skins;
- Optimise the prototype plant in terms of resource efficiency and saving (water, energy, emissions) and of economic sustainability, by using automated technologies and low maintenance strategies;
- Scale up the formulation of the lacquer processed using the extracted cutin and environmentally friendly solvents;
- Find the best storage condition for the cutin, to guarantee a continuous production of the bio-lacquer;
- Demonstrate the technological suitability of the bio-lacquer for food packaging applications and perform a life-cycle assessment for the new eco-cans;
- Demonstrate compliance with the EU regulation for food contact materials at the end of the shelf-life of the food cans; and
- Analyse the economic potential of the tomato skins (e.g. for bio-energy applications).

LIFE13 ENV/IT/000590
LIFE BIOCOPACPlus



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Duration of project:

36 months (01/06/2014 – 31/05/2017)

Total budget in euro:

2,056,045.00

EC contribution in euro:

1,018,022.00

Themes: Climate change - Energy: Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies - Eco-products design / Industry-Production: Food and Beverages / Risk management: Pollutants reduction / Waste: Agricultural waste - Waste use

Expected results

- The valorisation of tomato by-products;
- An innovative prototype for the continuous extraction of cutin;
- A bio-lacquer obtained from the cutin;
- New eco-metal food packaging protected with the bio-lacquer;
- An innovative solution for bisphenol A (BPA)-free packaging;
- Evaluation of the costs of the new packaging to prove the economic viability of the proposed technology;
- The use of biodegradable, eco-friendly bio-lacquer to provide significant environmental benefits; and
- Lower use of fossil fuel resources and reduced CO₂ emissions.

Titanium life in titanium hands: advanced use and reuse

Project background

Metal recycling plays an important role in manufacturing activities, providing environmental benefits in terms of energy saving, reduced greenhouse gas emissions and reduced waste volumes. Manufacturing activities attempt to reduce the related costs and shorten the recycled metal supply chain. In the case of titanium, recycling is even more important, because the current titanium extractive metallurgy process, leading to titanium sponge, is extremely labour, energy and capital intensive. Moreover, subsequent crushing and repeated melting of the sponge is necessary to remove inclusions and reach the required level of uniformity. Therefore, the multiple steps of the primary metallurgical processes mean that titanium-embodied energy is relatively high compared to that of other commonly-occurring metals.

Project objectives

The 'LIFE for life's material' project aims to develop and test two innovative technologies: cryogenic machining and spark plasma sintering (SPS). Either technique alone would not allow reprocessing or recovery of titanium chips on site, but used in conjunction they open the way for a completely new approach to machining and closed cycles with zero waste production. The project will thus combine the two technologies to develop a small demonstration line for complete and direct recycling of titanium chips, and the chip removal process (about 1 500 kg/year). The process entails lower temperature and low thermal conductivity, meaning longer useful life of cutting tools and higher machining speeds for greater energy efficiency. By using liquid nitrogen instead of lubricant oil, high-quality grade 5 titanium pieces will be produced, titanium chips will not be superficially polluted by oils, and the final product will be protected against oxidation.

Expected results

- Complete elimination of the use of lubricants and lubricating/cooling oils or their emulsions in titanium grade 5 machining. Currently, the estimated consumption of lubricating/cooling oil is 2 000 Kg/year;
- Longer useful life of cutting tools by up to 40% in the case of turning or by 260% in the case of milling. This will result in less waste and a lower level of contamination of the titanium chips processed;
- Full recycling of titanium swarf that is no longer contaminated by organic lubricant/coolant, for an annual amount of 1 500 kg, without any treatment prior to sintering;

LIFE13 ENV/IT/000593
LIFE for life's material



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Duration of project:

36 months (01/06/2014 – 31/05/2017)

Total budget in euro:

1,529,151.00

EC contribution in euro:

745,725.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies / Industry-Production: Metal industry / Risk management: Pollutants reduction / Waste: Industrial waste - Waste recycling - Waste reduction - Raw material saving

- Energy consumption reduced by 40-60% compared to remelting in a vacuum induction furnace;
- Elimination of the need to clean the titanium chips (no use of soaps, detergents and pickling acids) or the machined components, as liquid nitrogen just evaporates into the air without polluting;
- Development of lighter and innovative high-performance components;
- Production of titanium components at a lower cost compared to those obtained by processing bars or by casting; and
- Elimination of the costs of disposal of titanium swarf contaminated by lubricant and coolant.

Innovative process with new polymer coatings for eco-sustainable non-galvanized steel wires

Project background

The EU produces on average six million tonnes of wire products every year. Most specialised companies in this sector are medium in size, but the market is dominated by a few large producers responsible for about 70% of production. Some 32% of the total production in Europe comes from Germany, followed by Italy which accounts for 22%. Italy produces about 1 250 000 tonnes of wire mesh, 300 000 tonnes of wire mesh products, and has about 74 production facilities. Wire production consumes large quantities of resources, in particular, energy, water, oils, acids and zinc. At the same time, manufacturing activities produce emissions, wastewater (with suspended solids, dissolved iron, traces of other metals and soaps), liquid waste, sludge and solid waste.

Project objectives

The LIFE-Inno.Pro.Wire project aims to develop and demonstrate an innovative process for the production of extruded steel wires, with lower environmental impact compared to the conventional process. The innovation is based on the use of a new polyamide coating for steel wires called PA6, which is used instead of PVC, to improve environmental and technical performance. The new process will be demonstrated on an extrusion line, in which softened metal is forced through a shape to produce a continuous ribbon of wire product. Energy savings can be made, because the process of galvanisation can be eliminated.

The specific objectives are to:

- Develop a replicable methodology for the production of eco-sustainable non-galvanized steel wires, including new materials and new processes;
- Implement a pilot system demonstrating the benefits related to energy and resource savings, and to assess wire performance;
- Contribute to the implementation and consolidation of the PEF (Product Environmental Footprint) experimental methodology for an environmental assessment of processes and products;
- Contribute to the diffusion of technology in public procurement for construction and maintenance of roads (Green Public Procurement); and
- Raise awareness of the benefits of adopting environmental measures in industrial production among companies in the sector, national and international public institutions, and non-experts.

LIFE13 ENV/IT/000614
LIFE-Inno.Pro.Wire



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Duration of project:

36 months (01/06/2014 – 01/06/2017)

Total budget in euro:

781,877.00

EC contribution in euro:

377,005.00

Themes: Climate change – Energy: Energy efficiency – Energy saving – Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies – Eco-products design – Integrated management / Industry-Production: Metal industry / Waste: Industrial waste – Waste reduction – Raw material saving

Expected results

- The adaptation of the extrusion line for the new process, along with a demonstration of feasibility and the specifications for a replicable process with low resource and energy impacts.
- Average savings of 20% of the weight of polymer with reference to the tonnes of coated wire, achieved by a lower specific weight of the compound and by the innovative extrusion process that provides lower material thicknesses;
- Energy savings of approximately 47% (from 164 to 90 kW) and elimination of logistical costs for moving galvanized wire with trucks;
- Elimination of the waste typically generated with hot galvanising and the use of chemical baths; and
- Elimination of zinc dust and the related filters used during the life-cycle of the process.

MED Medical Equipment Discarded – A new integrated system to reduce waste by medical equipment and medical WEEE

Project background

The life-cycle of equipment in a medical institution is short due to the need to ensure functionality, security and adaptation to new standards. It is estimated that equipment in European hospitals has an average life-cycle of five years. The disposal of the equipment follows different processes that can vary according to place and type of device. However, the disposal of these devices, which is not standardised, involves important ethical, environmental and economic issues. For instance, the devices are sometimes discarded in good condition and so could find a new use; they are disposed of without taking into account their characteristics; and they are donated to charities without first verifying their functionality, thereby transferring disposal problems to another entity. Environmental problems, such as harmful emissions and the presence of chemicals in the environment, can also occur.

Project objectives

The LIFE MED project aims to improve waste management for discarded medical equipment, with environmental, economic and social benefits.

Specifically, the project aims to:

- Implement a new integrated management system for discarded medical equipment, in particular biomedical devices;
- Prevent waste production in the medical sector;
- Manage medical waste by means of the specific characterisation of medical WEEE;
- Donate medical equipment accompanied by assistance and replacement of parts;
- Implement the project's approach in Romania; and
- Organise a stakeholder's forum (including associations of clinical engineers and biomedical technicians, WEEE and packing consortia, and representatives from the ministry, the region and the province) to discuss proposals, new procedures and legislative changes.

Expected results

- Analysis of the state-of-the-art for medical equipment disposal, to highlight the critical nodes on which the entire integrated system and the totality of the objectives identified will be focused (with four case studies);
- Scientific research aimed at finding the correct characterisation of 15 electro-medical devices;

LIFE13 ENV/IT/000620
LIFE MED



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Duration of project:

36 months (01/07/2014 – 30/06/2017)

Total budget in euro:

2,544,447.00

EC contribution in euro:

1,210,347.00

Themes: Environmental management: Life Cycle Assessment-Management / Information-Communication: Public and Stakeholders participation / Risk management: Human health protection / Services and Trade: Healthcare - Social work / Waste: Hazardous waste - Waste from Electrical and Electronic Equipment (WEEE)

- 250 tonnes of healthcare waste managed;
- 300 electro-medical devices reprocessed, 100 components disassembled and 100 tonnes of equipment reprocessed;
- 80 institutions receiving donated equipment, 160 medical equipment devices donated and 100 pieces of healthcare furniture donated;
- 500 requests for information on the distribution of home healthcare equipment, 200 healthcare equipment devices distributed, and 50 small electro-medical devices distributed;
- 100 contacts with health centres, 150 pieces of medical equipment treated, 30 tonnes of waste avoided and 50 tonnes of waste treated; and
- Life Cycle Assessment (LCA) for three electro-medical devices.

Technopolymers' sustainable extrusion process with a nanometric self-managed dehumidification method and global control

Project background

The presence of moisture in polymers and technopolymers has negative effects on their recycling. The dimension of the environmental problem is huge, as the use of plastics is constantly increasing. Technopolymers, in particular, had the largest growth (+8% in one year) compared to other plastics. It is becoming increasingly important to recycle this type of plastic, which has led industry to develop means of reducing polymer water content through de-moisturising systems such as hot air, electromagnetic fields and vacuum. Unfortunately, these methods are characterised by extremely low energy efficiency and by the generation of over-treated products, which can amount to 10-15% of the recycled material. The overtreatment is due to the fact that an effective removal of the excess water requires prolonged or multiple treatments at high temperature, which can negatively affect the material.

Project objectives

The LIFE long WASTE-FREE project aims to introduce an innovative method of measuring the real-time moisture content of polymers to be recycled, and to adjust the de-moisturising treatment according to the data acquired in order to avoid the formation of overtreated materials. This novel method of dehumidification during PVC production is expected to reduce energy consumption, the use of raw materials and chemical additives, and the production of waste.

Specifically, the project aims to:

- Demonstrate an innovative de-moisturising process that varies according to the moisture level of the input material, with load properties constantly measured and the equipment regulated accordingly so that only the required amount of energy is used and no more;
- Avoid thermally damaging the polymer material during the recycling process by using an improved temperature control system;
- Design, develop and apply real-time microwave-based sensing of moisture, to measure water content directly in the material to be processed and not in the air; and
- Construct a new system with a de-moisturising tunnel tilted at 45°, to maximise the exchange surface and avoid the use of hot air systems.

Expected results

- Up to 50% reduction in CO₂ emissions as a result of the new equipment using less thermal energy for dehumidification;

LIFE13 ENV/IT/000650
LIFE long WASTE-FREE LLWF



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Duration of project:

36 months (01/09/2014 – 31/08/2017)

Total budget in euro:

1,127,448.00

EC contribution in euro:

536,974.00

Themes: Air and Noise: Air pollutants / Climate change – Energy: Energy efficiency - Energy saving - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies / Industry-Production: Plastic - Rubber -Tyre / Risk management: Industrial risks - Hazardous substances - Pollutants reduction / Waste: Waste reduction - Raw material saving

- A drastic reduction in production-related waste, by avoiding the thermal degradation and inefficient dehumidification of plastics that can cause irreversible damage both to raw materials and final products;
- Savings in the use of raw material due to more precise moisture control upstream of the granulation process;
- Reductions in additives added (plasticisers, flame retardant, catalysts in general), which are the first to be volatilised due to drying problems in the event of over-dehumidification and are therefore used in excess. The new process will use only the amount of additives strictly necessary, with average reductions expected of around 30%; and
- Constant control and optimal management of the quality of the products.

“New Aluminum and Titanium Use and Recycling” for the long-term protection of steel in biocorrosive special environments

Project background

Metal chips of light alloys – such as aluminium (Al) and titanium (Ti) alloys – are a common industrial waste product. Recycling these chips brings economic and environmental benefits through the re-use of metal resources.

The removal of lubricants/coolants and of the oxidised layer is fundamental for the proper recycling of these metals. It is currently done by washing the chips in an ultrasonic bath with detergent solutions and then final pickling using acids. But this process not only creates hazardous wastewater, it also dissolves oxides and part of the metal.

Project objectives

The LIFE NATURE project aims to demonstrate a new, environmentally friendly process for recycling light alloy chips that are oxidised or contaminated by lubricants or coolants. It aims to use the recycled metal in the production of high-quality wire made with an outer shell of recycled light alloys.

The project will design, develop, test and optimise a drawing and co-extrusion demonstration system dedicated to Al or Ti alloys. This system will be based on initial studies of the ‘extrudability’ and reactivity of Al and Ti chips deriving from different types of processes. The system will treat even partially oxidised or contaminated alloys without the use of detergents or pickling substances.

The team will modify a standard drawing line for the production of steel wires with greater surface roughness to maximise adhesion of the outer coating at lower processing temperatures and without the need for hot-dip galvanising. It will modify the operating parameters of the cutting machine and electric welder for the manufacture of high-performance mesh and optimise the final annealing process. It will conduct an overall energy and environmental assessment of the new process.

The project hopes to demonstrate wire and welded wire mesh of increased durability, especially in the most extreme applications, compared to normal galvanised wire. This should reduce the dispersion of zinc oxide into the environment and increase the lifespan of the product. The products will be tested in severe corrosion conditions, such as those provided in the marine environment.

LIFE13 ENV/IT/000655

LIFE NATURE



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Giovanni CAVATORTA

Duration of project:

30 months (01/08/2014 – 31/01/2017)

Total budget in euro:

1,769,728.00

EC contribution in euro:

870,914.00

Themes: Climate change - Energy: Energy efficiency - Energy saving - Reduction of greenhouse gases emissions / Industry-Production: Metal industry / Risk management: Industrial risks - Hazardous substances - Pollutants reduction / Waste: Industrial waste - Waste recycling - Waste use

Expected results

- Demonstration of a process for recycling light alloy chips even if partially oxidised or contaminated by lubricants/coolants with capacity of 133-224 kg of chips per year;
- Valorisation of waste light alloy chips in the production of wire and electro-welded mesh of increased durability, scratch resistance and corrosion protection compared to normal galvanised wire;
- Reduced energy consumption and vapour emissions from lower processing temperatures;
- Avoidance of hazards associated with use of detergents and pickling substances as well as hot-dip galvanising;
- Reduced consumption of primary raw materials in the production of wire and wire mesh and reduction of associated economic costs, notably of zinc slabs; and
- Improved life-cycle performance of wires.

Sustainable Monitoring And Reporting to Inform Forest- and Environmental Awareness and Protection

Project background

National Forest Inventories (NFI) and forest monitoring by large-scale observation networks are recognised as a major source of information on European forests. In Italy, two monitoring networks were set up to comply with the requirements of previous EU regulations and the Convention on Long Range Transboundary Air Pollution: a large-scale monitoring network of around 260 plots on a systematic grid, and an intensive monitoring network of 31 selected case studies.

These two networks are complementary to the NFI. They have an estimated annual cost of around €850 000 and it is becoming increasingly difficult to keep the monitoring system operational in its current form. This is unfortunate because the evidence suggests that monitoring will be even more important in the future. To keep the system operational, it is, therefore, necessary to reduce its costs.

Project objectives

LIFE SMART4Action intends to redesign forest monitoring and its information and reporting system in Italy. It will ensure financial sustainability, despite budget restrictions, whilst maintaining high scientific reliability. Specific activities include:

- Designing a new system to reduce the current annual costs by 30%, and which recognises the importance of national and regional statistics on key variables linked to sustainable forest management and ecosystem services;
- Improve communication with and data transfer to relevant stakeholders (regional, provincial and local municipalities, national and regional parks, environmental agencies, managers, NGOs, citizens). This will increase awareness about forest-related issues, support forest monitoring and consolidate knowledge about key forest variables for different stakeholders; and
- Develop and implement mechanisms to involve local people in plot management and basic monitoring for readily measurable variables.

Expected results

- The creation of an improved, cost-effective forest monitoring system;
- 21 information sheets (one per region and autonomous province) with a summary of the following data: forest resources, the status of tree health and plant

LIFE13 ENV/IT/000813
LIFE SMART4Action



Beneficiary:

Type of beneficiary

National authority

Name of beneficiary

Ministero delle Politiche Agricole, Alimentari e Forestali – Corpo forestale dello Stato – Ispettorato Generale Divisione 6

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Name of contact person

Enrico POMPEI

Duration of project:

43 months (01/09/2014 – 31/03/2018)

Total budget in euro:

2,206,527.00

EC contribution in euro:

1,099,213.00

Themes: Habitats: Forests / Information-Communication: Awareness raising – Information - Public and Stakeholders participation / Land-use and Planning: Forest management / Risk management: Risk assessment and monitoring

biodiversity, deposition of chemicals, tropospheric ozone, and climate variables in forests;

- 20-31 plot information sheets distributed to municipalities, provinces and regions where intensive plots are located;
- Estimations of the climate, soil, deposition and ground level ozone for all the intensive and extensive (around 260) monitoring plots over the next 10-15 years;
- Medium-term national trend projections regarding tree health, climate, and deposition and ground level variables for all the intensive (20-31) and extensive monitoring plots; and
- A practitioner's manual on the assessment of tree condition, growth and species diversity.

GREEN LIFE: Leather Industry for the Environment

Project background

The leather tanning process produces waste by-products equivalent to 50% of the raw material by weight. Around half of this material is used to produce fertilisers and biostimulants. The remaining waste, however, has significant environmental impact due to its high content of protein and other substances that have significant impact on plant metabolism. Leather tanning processes also cause volatile and particulate emissions into the atmosphere.

In addition, tanning wastewater presents significant management challenges. Around 1.91 kg of chemical products are used for the treatment of each square metre of animal hide. In Italy alone – which accounts for 62% of EU leather production – this equates to 47 000 kg of chemical products per year.

Most of the sludge resulting from tannery wastewater purification treatment is considered hazardous and is sent to landfill.

Project objectives

The 'GREEN LIFE' project aims to develop new technologies to reduce the environmental impact of the leather processing industry. It specifically plans to introduce an enzymatic and oxidative liming process to produce leather of the same quality, with reduced environmental costs.

Use of an enzymatic and oxidative liming process will avoid the use of harmful and toxic substances in the tanning treatment process. This will correspondingly reduce the volume of harmful waste by-products emerging from the process. It will also reduce the volume of unwanted hazardous emissions.

The system will incorporate recovery of at least 20% of the used water volume for recycling back into the liming process. This will reduce water consumption as well as reducing the volume of wastewater. The demand on wastewater treatment facilities will be further reduced due to the reduced contamination of the water.

The project aims to improve the selective recovery of by-products with industrial or agro-industrial value. This will not only enable the valorisation of this waste stream, but reduce the quantity of solid waste sent to landfill or for additional treatment.

LIFE13 ENV/IT/000840
GREEN LIFE



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

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Name of contact person

Guido ZILLI

Duration of project:

36 months (01/06/2014 – 31/05/2017)

Total budget in euro:

2,301,616.00

EC contribution in euro:

1,124,181.00

Themes: Air and Noise: Air pollutants / Environmental management: Cleaner technologies / Industry-Production: Leather and Footwear / Risk management: Pollutants reduction / Waste: Hazardous waste - Industrial waste - Waste reduction - Raw material saving - Waste use / Water: Water saving

Expected results

- A 100% reduction in consumption of soluble chromium in the treatment process;
- A 100% reduction in solid waste by-product containing chromium;
- A 75% reduction in generation of sulphates as by-product;
- A 20% reduction in water consumption;
- Reduction in the volume of wastewater to be treated and its contamination load;
- Reduction in unwanted emissions going into the atmosphere, including elimination of almost all odour emissions caused by sulphuric acid; and
- Recovery of 12-15% of the biomass – by dry weight – entering the system for valorisation, particularly in agriculture.

Monitoring biodiversity by a Citizen Science approach for solving environmental problems

Project background

The increasing loss of biodiversity can be attributed to the influence of human beings on the world's ecosystems. The EU 2020 Biodiversity Strategy foresees various actions with the aim of halting the loss of biodiversity, conserving and restoring natural habitats, and maintaining and enhancing ecosystems and their services. This strategy requires the co-operation and the engagement of citizens and the launch of 'citizen science initiatives'. These initiatives have a strong potential for the gathering and interpretation of scientific data, the dissemination of scientific information among the general public, and the active involvement of people in the defence of biodiversity. Today, the main challenge of citizen science is the collection of environmental data of high scientific quality. GMES, the EU contribution to the global observation system of systems and its biodiversity section GEO BON, as well as the shared environmental information system, aim to fulfill such a need.

Project objectives

The CSMON-LIFE project aims to contribute to a new strategic approach, by enlarging and improving the knowledge base for biodiversity policies in Italy. This goal will be achieved by involving citizens in data collection and validation, thus accelerating the progress towards the objectives of the European 2020 Biodiversity Strategy, and contributing to the formation of new 'green jobs'. The project will promote active collaboration among scientists, public administrations and citizens in discovering, monitoring and protecting biodiversity, thus providing a further contribution to the needs of policy makers. The project will make use of ICT, such as smartphones and tablets, to collect geo-referenced and validated biodiversity data, which will be integrated into the databases of the Italian national biodiversity network. The activities and results will be actively disseminated to local, national and EU administrations, scientific organisations and stakeholder groups.

Expected results

- At least 30 citizen scientists trained with the skills necessary to perform data validation;
- A network of at least 2 000 citizen scientists;
- At least 20 000 records collected;
- Dissemination of the aims of the project;
- Creation of a distribution map for each of the target species in the survey area;

LIFE13 ENV/IT/000842
CSMON-LIFE



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Stefano MARTELOS

Duration of project:

42 months (02/06/2014 – 02/06/2017)

Total budget in euro:

2,206,700.00

EC contribution in euro:

1,102,245.00

Themes: Biodiversity issues: Urban biodiversity / Information-Communication: Awareness raising – Information - Environmental training - Capacity building - Public and Stakeholders participation

- Dissemination of a white paper on best practices in citizen science;
- Organisation of at least two international events with the involvement of the EU infrastructure Lifewatch and the new European Association for Citizen Science (EACS);
- Organisation of an information campaign on the value and importance of biodiversity;
- Contribution to the project Sistema Ambiente 2010 of the Italian Environment Ministry by connecting the databases of CSMON-LIFE to the federated database system of the Italian national biodiversity network; and
- Contribution of data, technology and methods to European and global networks of biodiversity, including Lifewatch and GEO BON.

inREACH: protecting health and environment by streamlining REACH compliance check at European Economic Area import stage

Project background

The EU REACH Regulation aims to ensure that goods imported into the EU undergo the same checks as equivalent goods produced within the EU territory. It includes the requirement for producers and importers of chemicals to prove that their substances are safe before they can be placed on the market. But, its application is not sufficiently harmonised to ensure consistently reliable information on imported substances. There is a need for better information concerning the impact of many chemicals present in these goods, their correct usage, and on the exposure arising from their downstream use. Furthermore, the establishment of liability in relation to the marketing and use of imported dangerous chemicals needs to be clarified.

Project objectives

The overall objective of the inREACH project is to improve the protection of health and the environment by facilitating information exchange on chemicals imported into the EU and their compliance with the REACH Regulation, by means of innovative solutions with a public dimension.

Specific objectives are to streamline REACH and CLP (Classification, Labelling and Packaging) compliance checks for goods imported into the European Economic Area and the EU customs space, by simplifying access to and tracking of relevant REACH and CLP information, such as substance identity, registrant identity, substance registration status, safety datasheets and the presence of SVHCs. A more efficient collection and sharing of data on origin and destination of REACH and CLP-related goods for customs and enforcement authorities will facilitate transit through EU main access points, while ensuring proper data security and correct policies of access to them, in order to preserve confidentiality, industrial and intellectual property rights.

Expected results

The project's main expected results include:

- Overall evaluated reduction by 5-10% of actual unsafe chemicals entering into EU space/mobilisation/use;
- Improved science-policy integration and the transfer of results to provide a solid technical background for public bodies, authorities and the business community affected by the REACH Regulation;

LIFE13 ENV/IT/000849

LIFE+ inREACH



Beneficiary:

Type of beneficiary

Development agency

Name of beneficiary

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Stefano GIANAZZI

Duration of project:

36 months (01/09/2014 – 31/08/2017)

Total budget in euro:

801,034.00

EC contribution in euro:

400,517.00

Themes: Industry-Production: Chemicals / Information-Communication: Environmental training - Capacity building - Public and Stakeholders participation / Risk management: Human health protection - Pollution control / Services and Trade: Trade

- A national thematic stakeholder's platform established with links to relevant EU authorities and agencies to support project actions;
- Consolidation of the inREACH Framework and identification of the 25 most critical issues affecting REACH Regulation implementation;
- A roadmap for the definition of strategies and activities to overcome the 25 most critical issues affecting REACH Regulation implementation;
- Technical specifications for an operations and process model, supported by an ICT platform, to check compliance of chemicals with the REACH Regulation at the EU import stage; and
- Demonstration of the exploitability, viability and sustainability of the developed inREACH Framework at national level and its replicability potential at EU level.

Production of recycled high quality joists from wood waste

Project background

Waste management is one of the top priorities on Europe's environmental agenda, as stated in the recent Environment Action Programme to 2020. Notable efforts and actions have been invested in, policies and legislation have been updated and introduced, and studies and research carried out. However, there is still a great need for improved recycling practices and for raising the acceptance and uptake of such processes. As for wood, it is mainly recycled through the remanufacturing of engineered panels or used as a biomass fuel to produce energy. About 15 million tonnes per year still end up in landfills throughout Europe.

Project objectives

The LIFE GREENJOIST project aims to demonstrate the economic and environmental feasibility of an eco-innovative recycling process that is able to re-use and valorise wood waste to produce green, high-quality and cost-effective joists for different industrial sectors (e.g. manufacturing, transportation, logistics and construction). This will contribute to the consolidation of sustainable eco-innovative businesses in the EU woodworking industry, contribute to the achievement of EU 2020 goals for resource efficiency, and avoid dangerous impacts on human health and the environment.

With the potential to substantially cut the amount of currently landfilled wood waste, the project has set out a well-structured plan with the following key objectives:

- Define an innovative process for the production of high-quality, cost-effective joists from recycled wood waste through the setting up of a pilot plant;
- Increase the awareness of eco-innovative solutions among the general public, policy makers and the wood industry, focusing on their environmental and economic advantages as well as on their technical feasibility;
- Avoid the use of virgin wood in the construction of new joists and pallets, saving trees and reducing CO₂ emissions linked to transportation and processing; and
- Promote the shift from potentially harmful chemicals to natural components in the wood industry.

Expected results

- The design, setting up and operation of a pilot plant for the construction of high-quality joists made of

LIFE13 ENV/IT/000996
LIFE GREENJOIST



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Lauro ZOFFOLI

Duration of project:

36 months (01/07/2014 – 30/06/2017)

Total budget in euro:

1,706,456.00

EC contribution in euro:

818,333.00

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Environmental management: Eco-products design / Industry-Production: Wood – Furniture / Waste: Waste recycling – Waste reduction – Raw material saving – Waste use

- 100% recycled wood waste, using an innovative eco-friendly glue based on lignin, tannin or starch;
- Reach a full capacity for the pilot plant producing green joists, with 24-hour-a-day production;
- Use of 10 tonnes/day of recycled wood waste;
- Substitution of petrochemicals in glue with raw materials from renewable resources, namely lignin, tannin or starch;
- Monitoring and evaluating the production system and its impacts, with a life-cycle approach as well as testing the final product; and
- A set of demonstration and dissemination activities aimed at reaching a large and diverse number of stakeholders, including local communities, policy makers and industry operators, resulting in an increased awareness of eco-innovative solutions and green waste management processes.

Process and automated pilot plant for simultaneous and integral recycling of different kinds of photovoltaic panels

Project background

The European Commission included end-of-life photovoltaic panels in the WEEE Directive, which promotes the development of innovative processes for the recovery of secondary raw materials such as glass, plastics and metals. The recycling sector must now respond to the challenges and opportunities presented by this relatively new waste stream.

Project objectives

The PHOTOLIFE project aims to reduce the overall environmental impact of photovoltaic (PV) modules across their life-cycle by constructing a pilot treatment plant for end-of-life PV panels. Using relatively simple and mild physical and chemical operations, it aims to achieve a wide level of recycling and recovery of valuable raw materials in line with the WEEE Directive.

This innovative process, moreover, will enable the simultaneous treatment of the major types of PV cells, including monocrystalline silicon, polycrystalline silicon, amorphous silicon, cadmium telluride (CdTe) and copper indium gallium selenide (CIGS). It will adopt a hydrometallurgical approach, employing physical operations, such as crushing, to avoid energy consumption. It will also carry out chemical operations using aqueous/organic solution to avoid the combustion processes and pyrolysis, which are commonly employed for the detachment of the ethylene vinyl acetate (EVA) encapsulant.

The project expects to recover a significant amount of valuable raw materials – namely, the different metals contained within the PV cells as well as any metal frames, glass, plastics and electronic equipment used in the PV systems. It will characterise the different outputs of the recycling process, determine the overall economic feasibility of the pilot plant (including valorisation of the recovered materials) and put in place short and long-term management strategies for implementing the system.

Expected results

The main results include:

- Demonstration of a pilot treatment plant for end-of-life photovoltaics with a potential capacity of 200 tonnes/year of panels;
- Treatment during the project of about one tonne of panels of the main types;
- Full recovery of metals and metal concentrates (Zn, Al, Ag, Ti, Si, Te and Cd) as secondary raw materials – about 10-20% of the mass of treated panels;

LIFE13 ENV/IT/001033
PHOTOLIFE



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Luigi TORO

Duration of project:

39 months (01/06/2014 – 31/08/2017)

Total budget in euro:

1,284,796.00

EC contribution in euro:

634,000.00

Themes: Waste: Waste from Electrical and Electronic Equipment (WEEE) - Waste recycling - Waste reduction - Raw material saving - Waste use

- Full recovery of any aluminium frames – about 200 kg of aluminium recovered from each panel that has a frame;
- Full recovery of printed circuit boards and other electric equipment;
- Production of metal concentrates from Si panels and from CdTe panels (at least 0.5-1 kg samples for each concentrate).
- Optimised conditions for the treatment of wastewater (about 2 000 litres of wastewater treated for each kind of panel).
- Recovered glass (about 800 kg for each type of treated panel) and 200 kg of fine fraction treated by hydrometallurgical operation on a laboratory scale giving at least 0.5-2 kg of concentrated samples of the recoverable metals (Se, In, Cu, and Ga); and
- Reduction of energy consumption and CO₂ emissions throughout the life-cycle.

Mitigation of microplastics impact caused by textile washing processes

Project background

European oceans are contaminated by marine litter, especially plastics. Currently, it is estimated that global plastic production is increasing by 10% per year. Microplastics are particularly worrying, because wastewater plant treatments do not take them into account in their management processes and they are deposited in waterways and sewage sludge. Microplastic particles from synthetic clothing enter laundry wastewater and have been encountered in runoff and sewage waters, as well as in marine ecosystems in sediments. On average, more than 1 900 fibres of microplastics can be released by a synthetic garment during one wash. The main mechanisms responsible for the degradation of plastics in the marine environment are light-induced degradation and biodegradation. These processes are retarded in seawater due to lower temperatures and lower oxygen concentrations. Microplastics concentrate persistent organic pollutants via partitioning and they can be ingested by marine biota, thereby entering the food chain.

Project objectives

The main objective of the 'LIFE – MERMAIDS' project is to contribute to the mitigation of the environmental impact of microplastic and nanoplastic particles resulting from laundry wastewater on European sea ecosystems. This objective will be achieved by demonstrating and implementing innovative technologies, and additives for laundry processes and textile finishing treatments. Specifically, the project aims to:

- Demonstrate innovative additives to improve finishing textiles and finishing fibre treatments to avoid garments' microplastic removal in laundry processes;
- Demonstrate innovative additives for detergent and laundry products to avoid garments' microplastic removal in laundry processes in wastewater;
- Draw up good practice guidelines on microplastic retaining for plastic fibre manufacturers, textile industry and textile auxiliaries manufacturers, detergent manufacturers, and households; and
- Consolidate the knowledge of microplastic fibre-retaining technologies, the basis for the development of future policy recommendations in order to promote the widespread implementation of technologies that will contribute to reaching a good environmental status by 2020.

Expected results

- Reduction of at least 70% of the total amount of microplastic fibres currently discharged in laundry waste water;

LIFE13 ENV/IT/001069

LIFE – MERMAIDS



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Maurizio AVELLA

Duration of project:

30 months (01/07/2014 – 31/12/2016)

Total budget in euro:

1,287,123.00

EC contribution in euro:

643,561.00

Themes: Environmental management: Cleaner technologies / Habitats: Marine / Industry-Production: Textiles – Clothing / Information-Communication: Awareness raising – Information / Risk management: Pollutants reduction / Water: Water quality improvement

- An estimation and study of the amount of micro- and nano-fibres in effluents of domestic washes of different types of synthetic textiles;
- A characterisation and quantification of microplastic and nanoplastic contents contained in almost 10 different samples coming from washing wastewater;
- A set of tested recommendations for the optimisation of washing processes using the new finished textiles, the new detergents, and synergistic combinations of the new finished textiles and detergents;
- Increased knowledge and awareness of 3 000 consumers and professionals on measures to reduce microplastics arising from washes; and
- A set of policy recommendations based on a previous overview and a SWOT analysis of the regulatory framework concerning microplastic pollution control and prevention at a regional, national, European and international level.

Aerobiological Information Systems and allergic respiratory disease management

Project background

The most important biological component of ambient air is pollen, and its allergen is the main cause of airborne allergic respiratory diseases. Reasons for the increase in allergic responses to pollen allergen exposure are elusive, but environmental and lifestyle factors appear to drive the trend. In Europe, emissions of many air pollutants have decreased in past decades, resulting in some improved air quality. Nevertheless, this does not always produce a corresponding drop in atmospheric concentrations, especially for particulate matter (PM) and ozone (O₃), which have significant impact on human health. A growing body of evidence shows that air pollutants and aerosols can alter the impact of allergenic pollen and that pollen production rises in higher atmospheric CO₂ concentrations. Changes in the plant flowering season due to climate change will probably mean an increase in the duration and severity of the pollen season.

Project objectives

The overall objective of the AIS LIFE project is to develop an information base, in order to enable policy makers dealing with environment and health issues to better manage pollen-related allergic respiratory diseases.

Specifically, the project aims to:

- Improve pollen-related allergic respiratory disease management, through the permanent implementation of AIS in three European countries;
- Assess exposure to pollen at the general population level, by considering pollen and allergen quantities and their interaction with PM pollution;
- Provide a comprehensive evaluation of the use and effectiveness of AIS in different contexts;
- Increase awareness among target groups of the importance of integrated information on aerobiological, chemical and clinical forecasts for health improvement among pollen allergy sufferers; and
- Increase awareness of possible changes in lifestyle and preventative measures among sufferers of pollen-related allergic respiratory diseases.

Expected results

- Establishment and consolidation of a multidisciplinary, transnational network of experts in medicine, epidemiology, biology, environmental chemistry and computer information systems, working in the field of allergic respiratory health;

LIFE13 ENV/IT/001107
AIS LIFE



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Simone ORLANDINI

Duration of project:

36 months (01/06/2014 – 31/05/2017)

Total budget in euro:

1,536,084.00

EC contribution in euro:

763,595.00

Themes: Air and Noise: Air quality monitoring / Information-Communication: Awareness raising - Public and Stakeholders participation / Risk management: Human health protection / Services and Trade: Healthcare - Social work

- Implementation and dissemination of Integrated Information Systems (IIS) and enhanced Personalised Information Systems (PPI) in Italy, France and Austria;
- The widening of the Tuscan monitoring network for aerobiological components, by activating a sampling station in Pisa (Italy);
- A centralised database with Aerobiological Information Systems (AIS) data from the three countries;
- Three educational campaigns (Italy, France and Austria) on the use of the AIS, promotion of improved lifestyles, and prevention of respiratory allergic diseases;
- Three assessment reports on the effectiveness of user-friendly access to IIS and PPI; and
- Preparation of a map of urban and rural environments showing land use and allergic plant pollen data and agro-climatic indices in Tuscany.

Slag NO Waste: Innovative system for 100% recycling of white slag and for ZERO WASTE electric steel production

Project background

About 4.8 million tonnes of white slag waste material are produced every year by Europe's 300 steel plants. This is a special waste that mostly requires landfill disposal since no real widespread technology has been adopted to treat it. However, 'SNOW technology' offers new opportunities to re-use free lime components of white slag as an additive for steel production. Free lime (CaO) makes up around 40-45% of the white slag material and its re-use would reduce pressures on natural limestone resources (as well as reduce the considerable energy inputs and emissions involved in converting calcareous rocks into limestone). On a European level, it is estimated that more than two million tonnes of lime could be recovered from white slag, thus saving 3.6 million tonnes of natural resources from calcareous quarries.

Project objectives

The project's main goals focus on demonstrating the potential of SNOW technology to act as a cost-effective waste reduction and re-use solution for white slag (and associated frazzled refractory linings) from EU steel plants. An innovative system will be tested to verify optimal operational parameters for recovering free lime, dolomite and magnesium oxide from white slag and exhausted refractory materials. The recovery process will include reintroducing the materials directly back into the same steel-making process, thereby substituting 30-50% of the lime additive presently purchased.

In particular, the project activities aim to: minimise electric arc furnace (EAF) waste; limit the negative environmental impact of slag waste and its disposal in landfills; reduce demands on natural resources; decrease greenhouse gas emissions; and clarify solutions to help SNOW technology to be replicated as part of a zero-slag waste steel production cycle throughout EU steel-making plants.

Expected results

- An innovative industrial-scale prototype plant capable of obtaining zero slag waste from steel-making processes;
- Technological validation and performance analysis of the SNOW system in the ASO steel plant;
- Prevention of 4 500 tonnes of white slag (and frazzled refractory linings) from being landfilled;
- Zero-slag waste steel production in the ASO steel plant;

LIFE13 ENV/IT/001203
SNOW-LIFE



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Name of contact person

Massimo SVANERA

Duration of project:

48 months (01/06/2014 – 31/05/2018)

Total budget in euro:

2,449,682.00

EC contribution in euro:

666,497.00

Themes: Environmental management: Cleaner technologies / Industry-Production: Metal industry / Waste: Industrial waste - Waste reduction - Raw material saving

- Reduction of potential dust and odour sources from ASO steel-making;
- Substitution of 3 600 tonnes of virgin lime with the treated white slag thereby reducing natural resource use (limestone) by the ASO steel plant;
- Demonstration of the effectiveness of an innovative white slag recycling system that can be replicated by EU steel plants to help the sector become more resource efficient; and
- Demonstration of the recovery and re-use of secondary raw materials, such as those from lime that is recycled from white slag dolomite.

Soil Administration Models 4

Community Profit

Project background

Soils provide seven main ecological functions: carbon sequestration; water purification; erosion prevention; support of biodiversity; habitat for pollinators; production of wood/fibre; and food production.

However, these functions are inhibited by soil sealing as a result of human activities. Current studies suggest that soil sealing is nearly irreversible. It is therefore essential that territorial management planning takes into account the environmental and economic costs and benefits associated with soil functions when assessing land-use options. Such assessment could also help inform soil preservation interventions.

Project objectives

The LIFE SAM4CP project aims to create an easy-to-use simulator that will allow territorial decision makers to include the ecological functions of soil within the assessment of the environmental and economic costs and benefits associated with possible urban planning and land-use measures and choices.

The simulator will allow different territorial transformation scenarios to be assessed according to the seven main ecological functions provided by soil in order to integrate these functions – and their potential gain or loss – into the decision-making process. The tool aims to help avoid land-use decisions that disproportionately reduce soil functions. It also aims to enable a proper evaluation of the potential costs and benefits of specific measures aimed at reducing soil sealing. It will be used to help draft a municipal land-use plan to preserve the ecosystem services provided by soils.

The project hopes to demonstrate how use of the tool and integration of soil conservation considerations into the decision-making process can protect ecological functions for the benefit of the local community. It expects to demonstrate a significant reduction of soil sealing as well as overall economic savings thanks to the preservation of natural resources and restoration of the benefits provided by good quality soils.

Expected results

- Development of an urban planning tool that simulates territorial transformation scenarios and calculates the effects of soil consumption/sealing in terms of reduction of provided ecosystem services;

LIFE13 ENV/IT/001218
LIFE SAM4CP



Beneficiary:

Type of beneficiary

Local authority

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Simonetta ALBERICO

Duration of project:

42 months (03/06/2014 – 30/06/2018)

Total budget in euro:

1,425,350.00

EC contribution in euro:

700,474.00

Themes: Environmental management: Integrated management / Land-use and Planning: Soil and landscape protection - Spatial planning - Urban design

- Creation of a simulator based on the latest scientific knowledge on soil-provided ecosystem services and their economic value;
- Measurement of the environmental effects of soil sealing on the 27 territorial units of the Province of Turin and on local case studies in the same province;
- Assessment of cost and benefits (both in environmental and economic terms) of planning policies and land-use choices that aim to reduce soil sealing and preserve the associated ecosystem functions and services;
- Definition of actions to limit soil sealing in the four municipalities;
- Drafting of a municipal land-use plan incorporating urbanisation models but minimising soil sealing and preserving the ecosystem services provided by soils;
- Maintenance and increase of ecosystem functions provided by the soil to the local communities in the project areas.

Isover for recycling and ecosustainability

Project background

The environmental sustainability of insulation and waterproofing technologies in EU buildings sectors can be enhanced by improved management and re-use of bitumen-polymer membranes and glass fibres. These materials are classified as non-hazardous waste, and their disposal normally involves consuming land-fill space. Options exist to reduce the volume of this waste that enters landfills by introducing dedicated recycling procedures for recovering much of the valuable components (i.e. bitumen-polymers and glass fibres). Integrated approaches to waste minimisation for these materials should include: collection, storage, treatment, and re-use of waste production scraps of bitumen-polymer membranes and glass fibres scraps. Outcomes could thus provide significant environmental and economic benefits.

Project objectives

The 'Life Is.eco' project aims to implement an innovative recycling/waste management system for bitumen-polymer wastes and glass wool scraps. The project will achieve this aim by establishing two pilot plants to recover bitumen-polymer membranes and insulation mineral materials. The project will also help introduce dedicated recovery centres at factories in Vidalengo and Chieti. Here, these materials can be valued, prepared for re-use, and then converted back in the production cycle for new goods containing bitumen-polymer and glass wool.

Positive outcomes from the project will include: the validation of an innovative waste recycling and reduction system capable of reducing pressures on landfill; a reduction of soil sealing through the reduction of ground surface occupied by landfill; decreased consumption of energy and raw material related to landfill construction; and reduced air pollution associated with waste materials dumped into landfills.

Expected results

- Treatment and processing of around 130 000 m² of bitumen-polymers waste and glass fibre scraps per year from the Saint-Gobain PPC Vidalengo factory;
- Treatment of around 1 000 tonnes of insulation material scraps per year from the Saint-Gobain PPC Vidalengo factory; and
- Production of around 400 tonnes of material based on bitumen-polymers per year for use in the production of membranes and new insulation material.

LIFE13 ENV/IT/001225

Life Is.eco



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Name of contact person

Fabrizio CALGIONE

Duration of project:

48 months (01/06/2014 – 31/05/2018)

Total budget in euro:

2,626,488.00

EC contribution in euro:

1,050,773.00

Themes: Industry-Production: Non-metallic minerals / Waste: Construction and demolition waste - Industrial waste - Waste recycling - Waste reduction - Raw material saving

LIFE+ K-12 PU Disruptive technology to dramatically improve Energy Efficiency of Household Appliances

Project background

The domestic household sector is one of the largest consumers of electrical energy in the EU, consuming around 30% of the total electrical energy supply. In the past few years, the development of new green technologies has helped to reduce the energy consumption of individual electrical devices. However, at the same time, the number of such devices has increased dramatically, as has the amount of time they are typically in use. Thus, overall energy consumption has still increased.

Cold appliances - refrigerators and freezers - accounted for 14.5% of household energy consumption in 2010. Currently, most households still use old, energy-inefficient cold appliances.

Project objectives

The LIFE+ K-12 project aims to demonstrate the feasibility and effectiveness of manufacturing an innovative, polyurethane (PU) foam for improving thermal insulation and, thus, the energy efficiency of households' cold appliances. In doing so it aims to contribute to the EU's goals of creating an energy-efficient economy and mitigating the threat of global warming.

The project seeks to define at least two to three formulations of innovative, open-cell PU foams, with different chemistry, and to make corresponding adaptations to the manufacturing process at pre-industrial scale. Manufacturing adaptations will include the design of a new injection mix-head, the optimisation of the foaming injection parameters, and using CO₂ as a blowing agent.

The project will demonstrate this innovative foaming technology at pilot scale, and validate the thermal conductivity improvements of the new foam through efficiency tests. The real applied thermal-insulation - and thus energy-saving - benefits will be tested on 30-50 prototype refrigerators.

LIFE+ K-12 will develop European and global 'market introduction impact scenarios' for the new foam, and conduct a special product life-cycle analysis (LCA). The results will be used to quantify the environmental impact of a potential market introduction of the innovative foam, in terms of reduced energy consumption and carbon footprint.

LIFE13 ENV/IT/001238
LIFE+ K-12



Beneficiary:

Type of beneficiary

International enterprise

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Vanni PARENTI

Duration of project:

42 months (01/06/2014 - 31/05/2017)

Total budget in euro:

3,975,622.00

EC contribution in euro:

1,941,310.00

Themes: Climate change - Energy: Energy efficiency - Energy saving - Reduction of greenhouse gases emissions / Environmental management: Eco-products design / Industry-Production: Building

Expected results

- A new manufacturing process at pilot scale - with optimised foam-injection parameters and a new injection mix-head - for the production of an innovative, open-cell PU foam;
- A 30% improvement in the thermal conductivity performance of the new foam, compared to the current best in class with closed-cell PU foams;
- A 20% reduction in the energy consumption of cold appliances, with respect to the current best in class labelled A+/A++;
- Energy consumption in the overall fridge industrial production process reduced by up to 50%;
- Demonstrated feasibility of applying the novel insulation material with a zero ODP (Ozone Depletion Potential) and minimum - reduced to 1 - GWP (Global Warming Potential); and
- Demonstrated feasibility of up-scaling the production of the new open-cell PU insulation foam.

Dynamic Acoustic Mapping - Development of low cost sensors networks for real time noise mapping

Project background

The regular updating of noise maps using a standardised approach is required by the Environmental Noise Directive (END). Collated information is processed using acoustic models to produce the updated maps. This procedure is time consuming and costly, and has a significant impact on the budget of those responsible for providing the maps. Furthermore, END requires that simplified and easy-to-read noise maps are made available to inform the public about noise levels and actions to be undertaken by local and central authorities to reduce noise impacts. To make the updating of noise maps easier and more cost effective, there is a need for integrated systems that incorporate real-time measurement and processing to assess the acoustic impact of noise sources.

Project objectives

The LIFE - DYNAMAP project aims to develop a dynamic noise mapping system that is able to detect and represent in real time the acoustic impact of road infrastructures. This will help implement the END (European Noise Directive 2002/49/EC), which requires the updating of noise maps every five years. The project will develop an integrated system for automated data acquisition and processing of road noise. The main objectives of the project are therefore to:

- Automate the noise mapping process using the information retrieved from a low-cost monitoring network;
- Develop low-cost sensors and communication devices to collect the information needed to update noise maps in real time;
- Implement and test the system in two sites with different characteristics: an agglomeration and a major road;
- Demonstrate that the automation process will lead to a significant reduction in the resources needed to update noise maps (time, costs and dedicated personnel);
- Improve and ease public information through different access levels of the system to provide user-friendly information; and
- Check the possibility of improving the system with additional information to dynamically report multiple environmental data.

Expected results

- Development of low-cost sensors to measure the noise levels generated by sources in the mapping areas;

LIFE13 ENV/IT/001254
LIFE - DYNAMAP



Beneficiary:

Type of beneficiary

National authority

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Name of contact person

Patrizia BELLUCCI

Duration of project:

60 months (01/07/2014 – 30/06/2019)

Total budget in euro:

2,230,319.00

EC contribution in euro:

1,063,274.00

Themes: Air and Noise: Noise / Land-use and Planning:

Transport planning - Traffic monitoring - Urban design /
Risk management: Risk assessment and monitoring

- Development of a software tool for dynamic noise mapping, using real-time data management and processing;
- Implementation of two demonstrative systems: the first located inside the agglomeration of Milan and the second along a major road surrounding the city of Rome;
- The system tested for one year in order to assess its reliability, with any problems detected and solved, and its accuracy determined and uncertainty calculated in associated noise maps; and
- An analysis of the possibility of strengthening the system with applications for dynamically reporting integrated environmental data, such as air quality and meteorological conditions.

Crop selection models and agronomy techniques adapted to local pedoclimate conditions

Project background

The current system of breeding, testing and selecting wheat varieties is carried out in controlled environments that consume large amounts of energy. A new and evolutionary participatory breeding method offers opportunities to reduce the carbon footprint of wheat breeding, testing and selecting processes. This innovative approach emphasises the use of 'natural selection' principles in combination with site-specific farm selection techniques. The application of such an evolutionary breeding method involves fewer energy inputs.

Project objectives

The main aim of the LIFE SEMENte parTEcipata project centres on improving the resource efficiency of commercial plant breeding activities. It will create and maintain a composite cross-population of durum wheat germplasm (*Triticum turgidum subsp durum L.*) and other species of the genus *Triticum* using a novel and evolutionary genetic improvement technology that promotes agro-systems that are more resistant to climate change.

Specifically, the project aims to:

- Identify a low-input agronomic system, through crop rotation, to optimise evolutionary change within the gene pool, in order to stabilise production over time and ensure soil fertility that benefits the environment;
- Conserve durum wheat germplasm (*Triticum turgidum subsp durum L.*) and other species of the genus *Triticum* (e.g. *polonicum*, *turanicum* and *dicoccum*) from germplasm banks in the region of Sicily, and from collections of old varieties required by both national and international germplasm banks;
- Identify lines and accessions through the evaluation of germplasm in different locations (Tuscany, Sicily and Marche) that are suitable for organic cultivation in the areas tested;
- Establish a gene pool to be allocated to evolutionary breeding through the union of possible F1 individuals (from generations of crosses) obtained by diallelic crosses between the lines identified in the germplasm considered;
- Achieve improved gene pools, suitable for cultivation in the considered areas; and
- Produce new varieties that are selected by involving farmers (participatory breeding).

LIFE13 ENV/IT/001258
LIFE SEMENte parTEcipata



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Stefano BENEDETTELLI

Duration of project:

61 months (01/06/2014 – 30/09/2019)

Total budget in euro:

1,534,330.00

EC contribution in euro:

756,500.00

Themes: Climate change – Energy: Adaptation to climate change / Industry-Production: Agriculture – Fisheries / Information-Communication: Awareness raising – Information - Environmental training - Capacity building

Expected results

- Germplasm collection evaluated and characterised;
- A multiline population adapted to localised soil characteristics and climatic conditions;
- Technical guide to reasonable cultivation in an organic system that can be extended to an integrated and conventional system;
- Awareness raising and training for farmers to obtain the skills to maintain and improve the wheat germplasm;
- Durum wheat products with improved nutraceutical quality; and
- Availability of a wide assortment of multiline varieties adapted to cultivation environments.

Assessment of ecosystems and their services for nature biodiversity conservation and management

Project background

Environmental protection and management policies continue to be drawn up in the EU, and it is becoming increasingly important, as a result, to evaluate ecosystems. Such assessments have been incorporated into various EU planning documents, including the Biodiversity Strategy 2011 – 2020, which requires Member States to identify, map and assess ecosystems and their services.

In Latvia, however, such practices have not yet been introduced. In order to explain the importance of natural capital to decision makers, entrepreneurs and the general public, it is essential to assess the monetary value of ecosystems.

Project objectives

The LIFE EcosystemServices project will introduce an innovative approach to the conservation of natural values, while balancing those values with social and economic considerations. It will achieve this objective by providing knowledge on the use of environmental economic indicators that can be used in selecting development scenarios for different regions of Latvia and updating relevant planning documents.

Specific aims of the project are to:

- Adopt international best practices and experiences in economic valuation of ecosystems and their services for different scenarios in Latvia, creating a clear, comprehensive assessment system;
- Pilot the implementation of the developed assessment system in two areas;
- Map the ecosystems and their services in the selected pilot areas in order to determine the current situation;
- Carry out an economic evaluation of the identified ecosystem services by applying various existing methods integrated into an innovative methodological approach;
- Draw up and evaluate development scenarios for the selected areas;
- Incorporate the results and recommendations of the scenario evaluations into municipal planning documents;
- Update the Nature Conservation Plans for the Ķemeri National Park and the Piejūra Nature Park by including new areas into the protected territories and updating the ecological planning of the existing areas,
- Update the Spatial Development Plan of the Municipality of Saulkrasti, based on the results of the new methodological approach; and

LIFE13 ENV/LV/000839
LIFE EcosystemServices



Beneficiary:

Type of beneficiary

National authority

Name of beneficiary

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Andris ŠIROVS

Duration of project:

48 months (01/06/2014 – 31/05/2018)

Total budget in euro:

753,290.00

EC contribution in euro:

376,641.00

Themes: Environmental management: Integrated management / Habitats: Grasslands / Industry-Production: Agriculture – Fisheries / Information-Communication: Public and Stakeholders participation / Land-use and Planning: Sensitive and protected areas management – Soil and landscape protection

- Make recommendations for applying the new approach in municipal decision-making and spatial-planning processes.

Expected results

Main results will include:

- Multilayer maps of ecosystems and their services for the selected areas (two maps);
- A new methodological approach based on the innovative integration and verification of existing methods into municipal decision-making and spatial-planning processes;
- The economic evaluation of ecosystems and their services for the selected areas; and
- The economic evaluation of development scenarios for the selected areas.

Integrated planning tool to ensure viability of grasslands

Project background

Natural and semi-natural grasslands (NSG) are complex ecosystems that provide a range of ecosystem functions and services, which are essential for maintaining biodiversity and healthy societies in general. Loss of grassland biodiversity leads to the degradation and even total destruction of ecosystem functions and services, which would require enormous financial investments to provide artificially.

Measures within the Rural Development Programmes tend to promote agricultural production and intensive land use rather than extensive, nature-friendly management practices. It is, therefore, important to move from subsidy-based grassland management towards economically viable and area-specific management models for the multifunctional use of grasslands.

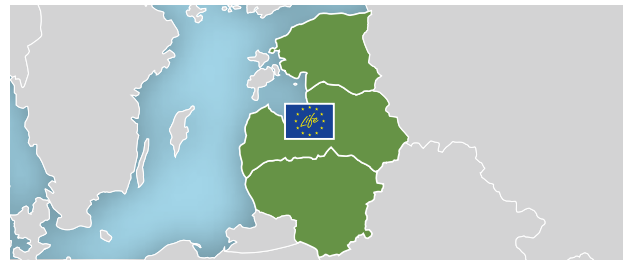
Project objectives

The LIFE Viva Grass project aims to contribute to the improvement of land use and nature conservation policies and to the legal framework for the long-term maintenance of grassland biodiversity and the ecosystem services they provide. It will achieve this aim by encouraging an ecosystem-based approach to planning and by promoting economically viable grassland management. The project will demonstrate opportunities for the multifunctional use of grasslands as a basis for strengthening the sustainability of rural areas and as a stimulus for local economies.

Specific objectives include:

- Policy assessment and evaluation of experiences in maintaining grassland ecosystems;
- Establishment of an active stakeholder network for the implementation of demonstration actions;
- Development of an integrated planning tool for sustainable grassland management, which allows for the compiling of spatial data layers on grassland ecosystems, demonstrates its causal relationship with social-economic data, and generates sustainable grassland management scenarios;
- Demonstration of ecosystem-based solutions for planning and viable grassland management in nine case study areas at regional, municipality, farm and protected area level;
- Monitoring of the environmental and socioeconomic impacts of the demonstration activities; and
- Drawing up of capacity building programmes.

LIFE13 ENV/LT/000189
LIFE Viva Grass



Beneficiary:

Type of beneficiary

NGO-Foundation

Name of beneficiary

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Kestutis NAVICKAS

Duration of project:

54 months (01/06/2014 – 30/11/2018)

Total budget in euro:

2,751,426.00

EC contribution in euro:

1,370,563.00

Themes: Environmental management: Integrated management / Habitats: Grasslands / Land-use and Planning: Sensitive and protected areas management - Soil and landscape protection

Expected results:

- Common policy shortcomings identified and recommendations developed for national and EU policies and for legal documents on strengthening synergies and eliminating shortcomings to ensure long-term maintenance of grassland biodiversity;
- Integrated planning tool for sustainable grassland management developed and tested in nine case study areas;
- Grassland ecosystem services mapped and assessed in the nine study areas;
- Proposals for economically viable grassland management models developed for the study areas;
- Sustainable multifunctional grassland management business plans developed for two farms;
- A landscape protection and development plan drawn up for one case study area and adopted by the local government; and
- Around 140 ha of grasslands restored.

Demonstration and validation of Direct Injection of CNG in vehicle engines and its environmental benefits

Project background

Transportation is currently responsible for around 23% of the world's greenhouse gas emissions, and the number of vehicles on the roads is steadily increasing. At the same time, strict environmental regulations are being introduced to limit emissions. In 2011, European fleet emissions averaged 136.6 g CO₂/km compared to 186 g CO₂/km in 1995, which is a 26.6% decrease over the period. This is the result of long-term efforts on the part of industry, which have been sustained both with and without legislation. Additional European CO₂ targets of 95 g CO₂/km have been set for 2020, while the soon-to-be-introduced EURO6 regulations will further limit car emissions. At the same time, Europe is looking at alternative fuel sources, such as Compressed Natural Gas (CNG), to reduce oil dependency.

Project objectives

The LIFE DI-CNG project aims to take a large step towards clean road vehicles by developing and demonstrating a new injection technology that will allow Direct Injection of Compressed Natural Gas (DI-CNG) into car engines. The use of such an innovative technology will bring enormous emission reductions compared to gasoline or diesel engines.

DI-CNG will have performance characteristics (e.g. power and torque) that are compatible with diesel and gasoline engines, which is unique for alternative fuels. This performance can also be reached without compromising injector durability and reliability or engine safety. The injector will be made fully compliant with original equipment manufacturers' specifications and regulations. Moreover, the need for exhaust after-treatment in diesel engines will be alleviated, thus adding to the simplicity of the system. The project will demonstrate the feasibility of manufacturing injectors at equal or lower environmental impact than current gasoline injectors, and thus much lower than diesel injectors. In other words, the strongly reduced environmental impact over the entire product lifecycle will not be offset by an environmentally taxing production cycle.

Expected results

- A 23-25% reduction in CO₂ emissions (with 6+% expected due to improved combustion efficiency);
- 90% reduction in PM pollution emissions at the engine outlet compared to diesel engines;

LIFE13 ENV/LU/000460
LIFE DI-CNG



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Camille FEYDER

Duration of project:

48 months (02/06/2014 – 31/05/2018)

Total budget in euro:

7,969,959.00

EC contribution in euro:

3,432,479.00

Themes: Air and Noise: Air pollutants / Climate change – Energy: Energy supply - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies / Industry-Production: Engines - Machinery – Vehicles / Risk management: Pollutants reduction

- Reductions of up to 80% in CO (gasoline engine) and 35-60% in NO_x (diesel);
- The installation of DI-CNG on all new cars translates into a saving of 6.97 Mt of CO₂ in the first year (at 17 000 km/yr and production of 12.8 M cars/yr);
- A production process with similar impact as gasoline injector production (lower than for diesel);
- New technology that is competitive with current CNG solutions as well as with direct injection diesel and gasoline engines, within a system that is fully compliant with upcoming EURO6 regulations and other expected legislation; and
- The same environmental benefits as on the R&D laboratory scale, with all the expected technical characteristics achieved.

ENERGA Living Lab for the improvement of the energy end-use efficiency

Project background

Improving energy efficiency is one of the key goals of EU climate policy. This can be achieved through various measures at different stages of the energy chain: generation, transformation, distribution and consumption. The LIFE-ENERGA Living Lab-PL project focuses on consumption and will develop and test solutions for consumers/customers (mainly individual households) that encourage them to use electricity more efficiently.

Project objectives

The project aims to demonstrate an innovative system for the efficient management of electric energy in private households. It will demonstrate, raise awareness of, and disseminate information about HAN solutions – an innovative system for efficient electric energy management in individual households. It will also contribute to the wider practical application of the system among domestic electricity customers, thus helping to reduce their CO₂ emissions.

More specifically the project will:

- Prepare HAN demonstration infrastructure and construct and install this pilot infrastructure in 60 apartments and 90 houses;
- Test the HAN system in 'Living Lab' conditions, i.e. with active involvement of end-users;
- Conduct awareness-raising activities about HAN technology; and
- Constantly monitor the impact of HAN on energy efficiency to determine the boundary conditions for its future implementation in other European cities.

Expected results

- HAN technology will be implemented and tested in real conditions;
- The installation of 150 individual pilot HANs;
- 30 pilot HAN installations working together with renewable energy sources;
- An analytical report summarising the HAN technology implementation tests;
- A technical report describing the power grid boundary characteristics necessary for effective HAN system implementation in a given area;
- The reduction of electricity consumption by 123.06 MWh per household;
- The reduction of CO₂ emissions by 109.52 Mg per household;
- Materials promoting HAN technology;

LIFE13 ENV/PL/000004
LIFE-ENERGA Living Lab-PL



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

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Magdalena PAJAŁ

Duration of project:

34 months (01/06/2014 – 31/03/2017)

Total budget in euro:

1,361,102.00

EC contribution in euro:

655,051.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Reduction of greenhouse gases emissions

- Approximately €16 000 of electricity consumption savings in households participating in the HAN technology tests; and
- Testing and demonstrating new technological solutions in 300 households (150 households with HAN and 150 households applying Time of Use tariffs).

Comprehensive monitoring of stand dynamics in Białowieża Forest supported with remote sensing techniques

Project background

Białowieża Forest (Puszcza Białowieska) is the last natural forest in Central Europe. Around half of its area is currently protected and excluded from direct human influence. No forest management is carried out in stands of trees older than 100 years. Therefore, the Białowieża Forest is a unique nature site, because it is subject to only marginal anthropogenic influence. The determination of forest dynamics, such as the changing competitiveness of tree species with different thermal requirements, indirectly reveals current trends in climate change. The observed changes in the tree species composition of semi-natural forests can therefore be the basis for adaptation of forest management practices to changing climate conditions and for conservation of valuable natural habitats that are sensitive to climate change.

Project objectives

The aim of the ForBioSensing project is to develop and apply a monitoring methodology for large forest areas using innovative techniques. This will involve point-scale monitoring (field measurements on sample plots) through to large-scale area monitoring using remote sensing techniques. This information will improve the efficiency of operations carried out for forest ecosystems protection and will further the study of forest biodiversity. Identification of changes in forest structure and tree species composition that occur in the forest stands will help to identify the determinants and dynamics of these processes, and help national park and forest district managers implement relevant protection activities. Therefore, the project can contribute to modifications of forest management and nature conservation practices in Polish forests that take into account projected climate change.

Specifically, the project aims to:

- Monitor stand dynamics in Białowieża forest, including analysis of tree species composition, monitoring of forest stand changes caused by spruce and ash dieback, and hornbeam expansion;
- Analyse natural forest regeneration and rejuvenation, including the role of gaps; and
- Identify the combination of various remote sensing techniques and datasets that would be optimal for forest monitoring needs.

Expected results

- Creation of monitoring methods for Białowieża Forest dynamics that combine data from field sample plots

LIFE13 ENV/PL/000048
LIFE+ ForBioSensing



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Duration of project:

81 months (01/10/2014 - 30/06/2021)

Total budget in euro:

4,063,426.00

EC contribution in euro:

1,958,988.00

Themes: Climate change – Energy: Adaptation to climate change / Habitats: Forests / Land-use and Planning: Forest management - Sensitive and protected areas management

and ancillary remote sensing data covering the whole study area;

- Mapping of plant communities with identification of different tree species;
- Implementation of a geo-portal with all gathered and produced spatial data on the forest;
- Maps showing detailed information about the trees in the forest; and
- Increase in the density of the existing network of meteorological stations for the analysis of the Białowieża Forest microclimate, and the creation of an online weather service that will help promote the project.

Anti-dust solutions in Bucharest

Project background

In order to improve the quality of air and to reduce the level of particulate matter (PM10) in urban areas, different methods of coagulating dust particles through dust-binding agents have been used, but only in separate actions. Scope exists to produce broader environmental benefits (concerning PM10 reduction) by combining different types of methods for using dust-binding agents during the washing of streets and construction sites.

Project objectives

The LIFE ADB project's main objective is to demonstrate specific methods for coagulating dust particles in urban areas through dust-binding agents that reduce airborne particulate matter (PM10).

A pilot programme will be carried out throughout Bucharest where different agents will be applied (one based on magnesium acetate and calcium, another one based on a solution made out of exclusively natural compounds) on busy traffic boulevards and streets. The project will help confirm optimal variables (freeze-thaw, season, weather, traffic data) and parameters (concentration, dilution, etc.) for determining the most suitable dust-binding agent for Bucharest.

Specific objectives are to

- Establish a method and piloting combined application (depending on the season and other environmental factors) of different types of dust-binding agents;
- Draw up regulations for applying dust-binding agents on busy traffic boulevards and construction sites in order to reduce the level of PM10;
- Consult with stakeholders on the new set of rules and regulations; and
- Disseminate project results, so that they can be applied in other contexts.

Expected results

- Testing of different dust-binding methods at six test sites (covering around 200 km of streets) experiencing very heavy traffic and one test area situated near a construction site;
- Demonstration of a methodology for testing in the selected areas;
- Application of treatments for a minimum of 168 days in the target areas; and

LIFE13 ENV/RO/001077
LIFE ADB



Beneficiary:

Type of beneficiary

Local authority

Name of beneficiary

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Grigore OANA

Duration of project:

27 months (01/09/2014 – 30/11/2016)

Total budget in euro:

459,342.00

EC contribution in euro:

229,671.00

Themes: Air and Noise: Air pollutants / Risk management: Human health protection - Pollutants reduction

- A guidance manual that is informed by project conclusions vis-à-vis correlations between application of different coagulants and their effects on PM10 values, in different meteorological and traffic conditions.

LIFE for European forest genetic monitoring system

Project background

Sustainable forest management is based on the long-term adaptability of forest ecosystems that starts at the genetic level. Forest genetic monitoring is therefore a crucial component of any sustainable forest management operation, as it presents the possibility of detecting potentially harmful changes in forest adaptability before they are seen at higher levels. By introducing genetic monitoring into conservation programmes and sustainable forest management, it is possible to assess information on relevant changes of a species' adaptive and neutral genetic variation through time.

Project objectives

The main aim of the LIFE GENMON project is to develop a system for forest genetic monitoring (FGM) to serve as an early warning system to aid the assessment of a species' response to environmental change on a long-term temporal scale.

Specifically, the project aims to:

- Define optimal indicators and verifiers for monitoring changes in genetic diversity across a transect from Bavaria to Greece for two selected target species (*Fagus sylvatica* and *Abies alba*);
- Draw up guidelines for FGM for these two, and an additional five species, which differ in their biology and distribution, for the implementation of FGM at a national, regional and EU scale;
- Create a manual for FGM, for implementation at EU level;
- Create a decision support system for an optimal choice of the level of FGM, based on needs and means;
- Organise a series of training courses for the forestry sector for implementation of FGM in their territories;
- Establish a well-functioning internationally linked team of forestry professionals working on FGM; and
- Provide access to all information directly, through existing networks or beneficiaries, and if requested, to transfer data to the EU Forest Data Centre of JRC.

Expected results

- Genetic monitoring regions delineated for seven species within the transect countries;
- Six genetic monitoring sites installed in three countries: two sites per country, one for *Fagus sylvatica*, and one for *Abies alba* and *Abies borisii-regis*;
- A database for storing demographic and genetic data;
- Minimum and optimal number of indicators and verifiers defined for three monitoring levels;

LIFE13 ENV/SI/000148
LIFEGENMON



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Hojka KRAJGER

Duration of project:

72 months (01/07/2014 - 30/06/2020)

Total budget in euro:

5,484,162.00

EC contribution in euro:

2,734,952.00

Themes: Climate change – Energy: Adaptation to climate change / Habitats: Forests / Information-Communication: Environmental training - Capacity building / Land-use and Planning: Forest management / Species: Plants

- Cost estimation of genetic monitoring per species, level and indicator assessed;
- Standardised protocols for collecting demographic and genetic data;
- Seven species-specific guidelines and strategies for the European FGM system;
- A manual for FGM, containing practical advice and including consequences for sustainable forest management;
- A decision-support system;
- Background documents and guidelines for policy makers at the national, regional and the EU level for supporting the development of possible new regulations at the national level, the FOREST Europe process, and for future European forestry and biodiversity conservation policies and strategies; and
- A solid background for the drawing up of future unified strategies for application of FGM to halt biodiversity loss at a European level.

Removal of hazardous substances in polyethylene packages using supercritical carbon dioxide (SC-CO₂) in recycling process

Project background

Around 3% of waste generated in the EU27 is hazardous, which represents about 12 kg of hazardous waste per capita (2006 data, EUROSTAT). EU legislation covering hazardous waste requires Members States to comply with certain rules concerning its collection, handling, recycling and treatment.

The conventional method for reducing or eliminating threats from hazardous waste containers involves the triple rinsing and draining of empty containers. In the case of plastic packaging, it involves pre-rinsing, crushing, washing (with different washing agents, detergents or surfactants) and subsequent rinsing and drying. After drying, the material can then be passed through an extrusion line, to produce a recycled material in pellet form.

This process requires large amounts of water, cleaning agents, and energy. It also produces large volumes of wastewater. Additionally, the recycled plastic obtained from a conventional recycling process is used in applications with low added value (e.g. pallets), as they generally have inferior mechanical and organoleptic properties.

Project objectives

The project's main objective is to demonstrate the viability of a new technique for eliminating hazardous substances from waste polyethylene (PE) packaging for solvents or phytosanitary products. The project will use a technology that applies a supercritical carbon dioxide (SC-CO₂) in the extrusion phase of the plastic recycling process.

This process is expected to partially, or totally, substitute two of the three stages involved in conventional treatments, which should reduce the labour requirement and the consumption of energy and water. The recycled material will then be employed in the production of packaging for hazardous substances, closing the life cycle. The project aims to provide a reference for the implementation of new solutions in the plastics recycling industry, leading to more efficient and environmentally-friendly processes, as well as higher quality recycled material.

Expected results

The project will develop a new recycling technology for waste plastic packaging for hazardous substances. If applied in ATECO's plastic waste management facilities,

LIFE13 ENV/ES/000067
LIFE EXTRUCLEAN



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Raquel GINER BORRULL

Duration of project:

30 months (01/07/2014 – 31/12/2016)

Total budget in euro:

1,473,010.00

EC contribution in euro:

674,254.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Reduction of greenhouse gases emissions / Risk management-Industrial risks: Hazardous substances / Waste: Packaging and plastic waste - Waste recycling - Waste reduction - Raw material saving / Water: Water saving

which uses three washes with a capacity of 18 m³ of water and has an annual output of 1 000 tonnes/year, the project expects to achieve:

- A reduction in water consumption: from 558 m³/year to 279 m³/year;
- A reduction in chemicals use: from 45 tonnes/year of surfactants, NaOH and wastewater treatment substances, to 15.75 tonnes/year; and
- A reduction in energy consumption: from 15 000 kWh/year to 1 500 kWh/year, which equates to a cut of 630kg CO₂/year.

Knowledge-Based Innovative Solutions to Enhance Adding-Value Mechanisms towards Healthy and Sustainable EU Fisheries

Project background

Discards refer to the practice of dumping overboard dead unwanted fish that are accidentally caught as by-catch during commercial fishing practices. Most conventional fishing operations produce discards (ranging from 2 to 10% for long-line methods and to 90% for trawling systems). New measures within the Common Fisheries Policy aim to reduce discards. This will lead to a decrease in the volume of such biomass reaching shore which will effect the operations of land-based facilities that currently utilise the discard biomass.

Project objectives

The main objective of LIFE iSEAS is to promote more sustainable fisheries practices through improving know-how about new approaches to managing discard biomass. This will be achieved through testing new technology (which builds on outcomes from the previous LIFE FAROS project) for automatically monitoring and recording discard material on-board deep-sea and other commercial fishing vessels. The new technology will provide real-time data that can be modelled to help direct fishing activities away from areas and practices that indicate high risks of producing discard biomass. Benefits will include more effective forms of precision-fishing that improve the commercial quality of catches and lead to more-resource-efficient operations (e.g. fuel and time savings).

Mitigating on-shore effects from improved discard management will also form an important part of the project. An 'Integral Discards Processing and Valorisation Point' will be established to explore new sustainable options for dealing with the transition process that follows the anticipated increase in precision-fishing at sea.

Expected results

- Improved knowledge of the socio-economic and environmental effects (positive and negative) of measures aimed at reducing discards;
- Demonstration (and further calibration of) the iObserver technology to automatically and efficiently provide the data that is needed for improving the management of discards;
- Development of data and metadata models plus a complete range of OGC services for acquired discards information that can be integrated on a fish discards SDI, in line with the INSPIRE Directive (2007/2/EC);

LIFE13 ENV/ES/000131
LIFE iSEAS



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Ricardo I. PÉREZ-MARTÍN

Duration of project:

48 months (01/07/2014 – 30/06/2018)

Total budget in euro:

3,866,342.00

EC contribution in euro:

1,919,325.00

Themes: Industry-Production: Agriculture – Fisheries / Waste: Waste reduction - Raw material saving - Waste use

- Creation of powerful modelling tool to improve analysis of fish stocks and potential discard risks in different fisheries. This will combine various data inputs to improve its efficacy for providing real-time guidance to help boat crews reduce discard volumes;
- Testing of as prototype facility (based at Marín port) to valorise, manage and trade discards that have been landed. Close cooperation between the facility and the fishing crews involved in the project is expected to improve the quality of discard biomass and thus improve its potential for commercial valorisation; and
- A detailed study (covering all stakeholders from the Galician fisheries sector) that clarifies the environmental and socio-economic impacts of proposed solutions for discard reduction.

Demonstrative pilot plant for the valorisation of non-ferrous metal waste

Project background

Zamak is a family of alloys, with a base metal of zinc (Zn) and alloying elements of aluminium (Al), magnesium (Mg) and copper (Cu). It is used in injection-moulding in various industries (e.g. ironwork, automotive parts, die-cast toys).

According to data from the European Foundry Association, 3.5 million tonnes of zamak was smelted in Europe in 2011. The companies in Europe that use and process zamak also generate an estimated one million tonnes of hazardous and non-hazardous waste every year, which is deposited directly into landfill sites, giving rise to significant environmental problems (e.g. soil pollution). However, this waste contains a variable amount of zinc alloy that can be recovered as zinc oxide.

Zinc oxide is the fourth largest exported mineral worldwide: According to figures from the International Zinc Association, a total of more than 1.2 million tonnes was consumed worldwide in 2011, with Europe accounting for around 300 000 tonnes.

Project objectives

The project aims to develop and test, at pre-industrial scale, a pilot plant using plasma technology to obtain zinc oxide from zamak waste (mainly foundry slag and sludge).

The zinc oxide obtained will meet all the technical specifications required to allow for its re-use. The processes will be tested and validated in two industrial sectors: the manufacture of rubber and chemical catalysts.

The new technology will enable significant reductions in the quantity of hazardous and non-hazardous waste that is currently sent to landfill. It will also increase the competitiveness and sustainability of this type of industrial process.

Expected results

The main expected results are:

1. The demonstration of a new technology to facilitate the recovery of zinc oxide from industrial waste; and
2. The validation of the use of the recovered zinc oxide in the manufacture of products in the rubber and chemicals' sectors.

LIFE13 ENV/ES/000173
LIFE GREENZO



Beneficiary:

Type of beneficiary

Research institution

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Jaime VILAPLANA

Duration of project:

36 months (01/06/2014 – 31/05/2017)

Total budget in euro:

1,062,170.00

EC contribution in euro:

525,910.00

Themes: Industry-Production: Metal industry / Waste-Hazardous waste - Industrial waste - Waste reduction - Raw material saving - Waste use

Over the course of the project, 1 600 kg of zinc oxide will be produced from 4 000 kg of residues.

If successful, the beneficiary believes the process has the potential to exploit over one million tonnes of the waste in Europe alone.

Development of demonstrative solutions to reduce the water contamination of agrarian origin in the Limia basin

Project background

The Galician region of Limia is a rural area that is heavily dependent on agriculture. However, farming is also one of the main contributors to changes in the water quality in the river Limia basin – identified by monitoring and studies carried out by the CHMS.

Problems arise when, either through diffuse sources or direct spills, large amounts of nitrogen and phosphorus compounds are deposited into the basin – mainly from agricultural activities, but also from urban waste.

This Limia river basin area covers several protected areas, including the Natura 2000 sites “ZEPA A Limia”, “Veiga de Ponteliñares”, and “ZEPA Baixa Limia -Serra do Xurés”.

Project objectives

LIFE REGENERA LIMIA aims to protect and regenerate the region’s river system, by demonstrating a series of techniques to reduce the presence of certain nutrients in the region’s fresh water supply, in particular those associated with agricultural activities.

Specific objectives are to:

1. Demonstrate better environmental management of farmland through the use of organic fertilisers. This will be done using an online integrated control system showing both economic and environmental gains;
2. Develop solutions for improved management of farm waste: the project proposes to create intensive artificial wetlands (a system of ponds) as a natural method of water-filtering;
3. Prove that the environmental regeneration of modified rivers, and the regeneration and reconnection of pond systems, are possible and can contribute to reducing both the presence of nutrients in the water and eutrophication. Such interventions would allow for the recovery of local ecosystems of importance to the Natura 2000 sites; and
4. Improve the distribution of information related to the use of fertilisers among farmers and other concerned professionals.

Expected results

The expected results include:

- A soil map and nutrient retention indices of the region’s farmland;
- An integrated fertiliser control system for farmland – to serve as an online tool for the use of fertilisers;
- 10 plots of farmland monitored through the pilot control system;

LIFE13 ENV/ES/000227
LIFE REGENERA LIMIA



Beneficiary:

Type of beneficiary

Development agency

Name of beneficiary

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Alberto DE ANTA MONTERO

Duration of project:

36 months (01/07/2014 – 30/06/2017)

Total budget in euro:

2,053,808.00

EC contribution in euro:

858,741.00

Themes: Biodiversity issues: High Nature Value farmland / Climate change – Energy: Reduction of greenhouse gases emissions / Habitats: Freshwater / Industry-Production: Agriculture-Fisheries / Risk management: Pollutants reduction - Pollution control / Water: Water quality improvement - Water resources protection

- A 30% reduction in the use of fertilisers per plot of land dedicated to crops (potatoes, cereals and vegetables);
- A 50% reduction in the use of fertilisers per pasture plot;
- A 60% reduction in greenhouse gases, by reducing the application of dung, slurry and nitrogenised mineral fertilisers;
- An artificial pond system created as a prototype for wastewater treatment;
- The treatment of 53 m³ of slurry per day (this equates to the waste generated by over 1 000 female pigs) in a closed cycle, by means of the artificial wetland; and
- Approximately 5 ha of former floodplain restored to its original status in the “Veiga Ponteliñares” Natura 2000 site.

Integrative management for an improved adaptation of cork oak forests to climate change

Project background

Cork oak (*Quercus suber*) forests are listed in the European Union's Habitats Directive as an important habitat for conservation. This West-Mediterranean habitat grows over approximately 20 000 km² in the EU – with around 65% found in Spain, Portugal, France and Italy. Climate change and cork production are among the main threats to the conservation of this important habitat. Of all the bioclimatic zones, the Mediterranean is considered one of the most vulnerable to climate change. For the oak forests, negative impacts are already starting to appear and include: lower vitality and productivity due to increased water stress; an increase in pests, especially the cork beetle (*Coraebus undatus*); and an increased frequency of forest fires.

Project objectives

The project aims to implement and demonstrate new forest management techniques for European cork oak (*Quercus suber*) forests to improve their adaptation and resilience to climate change and to enhance their prospects both for conservation and for management.

The techniques proposed address the main threats identified i.e. climate change, increased pests and the increased frequency of forest fires.

Specific objectives are to:

- Improve the vitality of cork oak forests and combat the problems of reduced water availability, while using new forestry techniques to increase the production of cork and associated revenues;
- Improve the structure of *Quercus suber* forests to reduce the impacts of fires, using new forestry techniques;
- Improve the ecological functions and resilience to climate change of degraded cork oak forests, using innovative forestry restoration techniques;
- Reduce the damage caused by the cork beetle (*Coraebus undatus*) using appropriate forestry techniques to control its populations and reduce the susceptibility of the cork oak to this pest;
- Develop forest management tools and make them available to the forest administration, ensuring the integration of climate change adaptation strategies into forest policy, specifically regulations for the Catalan cork forestry sector; and to
- Disseminate the techniques and tools developed at a local level (forest owners, managers and cork compa-

LIFE13 ENV/ES/000255
Life+ SUBER



Beneficiary:

Type of beneficiary

Professional organisation

Name of beneficiary

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Name of contact person

Joan ROVIRA CIURÓ

Duration of project:

48 months (01/07/2014 – 30/06/2018)

Total budget in euro:

1,097,039.00

EC contribution in euro:

547,337.00

Themes: Climate change – Energy: Adaptation to climate change / Environmental management: Integrated management / Habitats: Forests / Land-use and Planning: Forest management / Risk management: Natural risks / Species: Plants

nies) and within the EU countries concerned (Portugal, France, Italy).

Expected results

The expected results include:

- The implementation of at least 4 innovative forestry techniques based on:
 - Integrated forestry management models for improving vitality, cork production and fire prevention;
 - Forestry models for fire prevention in strategic locations; and
 - New restoration techniques for damaged oak forests.
- The implementation of two techniques for the control of *Coraebus undatus* on 43 pilot demonstration stands; and
- The development of tools for improved management and decision-making.

Implementing Methodologies and Practices to Reduce air pollution Of the subway enVironmEnt

Project background

In Europe alone, more than 60 cities use underground rail to facilitate commuter movement. With average return journey times lasting around one hour, these underground commuters can routinely be exposed to inhalable particulate matter (PM) levels that are higher than the normal legal limits for outdoor air quality in European cities (50 µg/m³ mean PM10 (PM <10 microns in size)). In fact, PM levels underground are typically much higher than those above ground. Moreover, when compared to outdoor air, subway air is not only overly-rich in iron but can also contain high levels of trace metals such as Mn, Cr, Cu, Ni and Zn, as well as the toxic metalloids, Sb and As. The physical form of these metalliferous micro-particles is typically highly angular, with abundant fresh fracture surfaces available for bio-molecular interaction. Such a metalliferous cocktail, especially given the high mass loadings being breathed, is likely to be unusually bio-reactive.

Project objectives

The overall aim of IMPROVE LIFE is to provide a benchmark study that will lead to real improvement in subway air quality. The project will be carried out in Barcelona, where the main pollutant sources will be identified to inform the prioritisation of cost-effective and low-energy air-pollution mitigation strategies.

The project will work with public transport authorities in the city, to improve their awareness of air quality and encourage them to develop best practice policies for improving underground atmospheric conditions.

The project's specific objectives include:

- Determining emission sources and their contribution to air pollution in both platforms and trains, identifying those that have a potentially higher health risk;
- Evaluating the effect of air-quality-mitigation measures already used in other subway systems worldwide (such as different types of break pad compositions, air filters, platform designs, as well as monitoring techniques, etc);
- Developing proposals for helping local/national authorities to implement effective air-quality-mitigation measures in subway systems;
- Assisting Barcelona's local transport services to implement a Strategic Plan designed to reduce air contamination in subways; and
- Acting as a catalyst for the allocation of local/national funds, allowing for the implementation of air improvement strategies.

LIFE13 ENV/ES/000263
IMPROVE LIFE



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Teresa MORENO

Duration of project:

42 months (01/10/2014 – 31/03/2018)

Total budget in euro:

813,727.00

EC contribution in euro:

406,863.00

Themes: Air and Noise: Air pollutants - Air quality monitoring / Land-use and Planning: Transport planning - Traffic monitoring / Risk management: Human health protection - Pollutants reduction - Risk assessment and monitoring

Expected results

Outcomes will include:

- A comprehensive database, identifying the main air pollution sources in both platforms and trains in underground transport systems worldwide, indicating which present potentially higher health risks to commuters, especially with respect to their chemical composition;
- An evaluation of the effect of air quality mitigation measures already used in some subway systems worldwide; and
- New protocols for helping local and national authorities to achieve effective air pollution mitigation strategies for subway systems.

Profitable small scale renewable energy systems in agrifood industry and rural areas: demonstration in the wine sector

Project background

Wine production is an important agri-food activity in large parts of Spain, France, Greece, Italy, Portugal and other countries in southern Europe. As Europe experiences the effects of climate change, vine growers in these areas could be forced to change the variety of grapes they cultivate or the location of their vineyards, and even in some cases to relocate their production to different areas. The wine sector needs to take action to reduce its environmental impact and to contribute to the fight against global warming.

Project objectives

The project will show that the use of renewable energy in the farming sector and other rural industries, using the wine sector as an example, is viable from a technical, environmental and economic perspective. In particular, the project will:

- Bring together information on renewable resources and energy demands, and identify key parameters to facilitate the future use of renewable energy;
- Develop a viability-assessment computer application for use in agriculture;
- Demonstrate and validate the results from these activities in the wine industry using agricultural (vine) and manufacturing (winery) renewable-energy system prototypes.

Key issues that the project will tackle will be: irregular production and consumption patterns of solar and wind energy; losses of any excess energy produced; and the lack of alternatives to the use of fossil fuels in farm machinery. The project will develop user-friendly software tools (for general use) for assessing the viability of the generation of energy from renewable sources. It will also develop software for professional use in energy engineering and technical design applications, suitable for the design of renewable energy systems in the wine industry.

The project will demonstrate three prototypes for renewable energy generation:

- Adaptation of a conventional diesel agricultural vehicle to hydrogen fuel consumption;
- Construction and installation of a hybrid system (diesel-photovoltaic) to generate energy for drip irrigation and hydrogen production; and
- Construction and installation of a hybrid system (photovoltaic-wind) to power a winery waste water treatment plant.

LIFE13 ENV/ES/000280
LIFE+ REWIND



Beneficiary:

Type of beneficiary

University

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José Luis BERNAL AGUSTÍN

Duration of project:

37 months (01/07/2014 – 31/07/2017)

Total budget in euro:

1,562,994.00

EC contribution in euro:

676,265.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Energy supply - Reduction of greenhouse gases emissions / Industry-Production: Agriculture – Fisheries - Food and Beverages

Expected results

The expected results include:

- A manual for the application of renewable energy in the agricultural sector and rural industries;
- A software tool to assess the viability of renewables to power the wine industry and other agricultural activities;
- A software tool for the technical design of renewable energy generation systems in the wine industry and other sectors;
- It is expected that the photovoltaic-diesel hybrid system will reduce diesel consumption from irrigation activities by c. 2 500 litres/year, producing cuts in CO₂ emissions of c. 7 000 kg/year; and
- The hydrogen-fuelled vehicle is expected to reduce diesel consumption by c. 900 L/year, with a corresponding reduction in CO₂ emissions of approximately 2 500 kg/year.

Implementing the Water Framework Directive to temporary rivers: tools for the assessment of their ecological status

Project background

The sustainable management of Europe's water resources are a challenge for water system managers in the context of climate change and demographic developments. The European Environment Agency 'State of Water' report highlights worrying trends, showing an increase in, and wider prevalence of, water scarcity and stress. By 2030, this is expected to affect about half of EU river basins. To respond to this, in addition to improving water allocation based on ecological flow, water efficiency measures should be taken to save water and, in many cases, to save energy too.

These issues are addressed by the EU Water Framework Directive (WFD), which establishes a legal framework to protect and restore clean water in Europe, and to ensure its long-term, sustainable use. The approach to water management is based on river basins, which are the natural geographical and hydrological units. The WFD sets deadlines for Member States to protect aquatic ecosystems, and covers inland surface waters, transitional waters, coastal waters and groundwater. However, measuring the ecological status of temporary rivers and how this affects their management remains an open question to be dealt with under the WFD.

Project objectives

The project will contribute to solving the problems related to the assessment of the ecological status of temporary streams through the development of software (TRESH) which, using hydrological and climatic data, can evaluate the river typology and the hydrological situation of the water body concerned.

Using two new concepts, Aquatic States and Hydrological Status, the TRESH software will provide managers with relevant data on the hydrological conditions in the river, and a calendar for taking samples at the right times to be comparable to those from permanent streams.

The project's outcomes will serve as a basis for the sound implementation of WFD river basin management plans and the evaluation of the effectiveness of mitigation measures in much of Spain and, hopefully, the whole of Europe (with a particular focus on the rivers of southern Europe).

LIFE13 ENV/ES/000341
LIFE TRIVERS



Beneficiary:

Type of beneficiary

University

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Narcis PRAT

Duration of project:

48 months (02/06/2014 – 01/06/2018)

Total budget in euro:

1,407,943.00

EC contribution in euro:

682,962.00

Themes: Habitats: Freshwater / Risk management: Risk assessment and monitoring / Water: River basin management

Expected results

The expected results include:

- An operational software tool for water managers for the diagnosis of the ecological status of temporary rivers;
- Collection of data (hydrological, physiochemical and biological) to assess variability at natural and impacted sites in 25 test water bodies;
- A database with about 500 records for each basin;
- Characterisation of more than 100 temporary streams based on their lifecycle and the implications for aquatic life;
- Evaluation of the relationships between the variability of hydrological and physiochemical conditions and their effect on aquatic life in 25 pilot basins;
- State-of-the-art guidelines and field protocols for WFD implementation; and
- A review of approaches and methods in Spain for the preparation of river basin management plans, with a particular focus on temporary streams.

Climate Change Prevention by the inclusion of nanoparticles in clays for the reduction of Ceramic Industry CO₂ emissions

Project background

The increase of greenhouse gases in the atmosphere, and consequent global warming, is mainly a consequence of the continuous burning of fossil fuels as the main energy source for industry and transport. Deforestation aggravates the problem. Reducing the levels of greenhouse gases in the atmosphere is necessary to ensure a good quality of life for future generations. Implementing energy efficiency measures, especially in industrial sectors, is essential to achieve this objective.

One of the industrial sectors with the highest energy consumption is the ceramics industry. This sector consumes large amounts of energy during all its processes, but mainly during firing, which is responsible for 50-60% of the total energy consumed. During firing, furnaces can reach very high temperatures that range between 800 and 1 200 degrees Celsius, which requires a significant consumption of fossil fuels, mainly natural gas.

Project objectives

The project's main objective is to reduce natural gas consumption and carbon dioxide (CO₂) emissions from the firing of ceramic materials in a factory producing bricks and roof tiles. This goal will be achieved through an innovative method that uses calcium carbonate (CaCO₃) nanoparticles in raw materials, which enables the firing temperature to be reduced.

The project will design and develop a prototype to produce calcium carbonate (CaCO₃) nanoparticles and introduce them into the ceramic mass to obtain a homogeneous mixture. The project will test the firing of the mixture at semi-industrial and industrial scale.

In particular, the project will:

- Analyse the chemical and mineralogical composition of the clays that will be used as raw material;
- Determine the optimum composition of the calcium carbonate mixture, to achieve the greatest energy saving and the maximum emissions reduction;
- Establish a process for adding nanoparticles to the raw material to produce a homogeneous mixture;
- Demonstrate the process at industrial scale;
- Analyse the resulting ceramic material, and demonstrate its viability in structural applications; and
- Conduct an environmental analysis of the industrial process.

LIFE13 ENV/ES/000375
LIFE NanoCeramiCO2



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Agripino PEREZ LORENZO

Duration of project:

34 months (01/07/2014 – 30/04/2017)

Total budget in euro:

923,190.00

EC contribution in euro:

461,595.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Reduction of greenhouse gases emissions / Industry-Production: Non-metallic minerals

Expected results

It has been estimated that a 14 degrees Celsius reduction in the firing temperature for bricks and tiles will result in an 8% reduction in energy consumption, and a reduction of 17.1 kg of CO₂ per tonne of fired product. Because of the small quantity of CaCO₃ nanoparticles used, the CO₂ emissions produced by its decomposition are very low and are not relevant in comparison with the CO₂ emissions generated during the firing process. Previous tests have achieved a temperature reduction greater than 14°C, and the project estimates that an overall energy saving of 10% can be achieved in the firing process, leading to a CO₂ emissions reduction of 1 800-4 500 tonnes/year.

Automatic control system to add organic waste in anaerobic digesters of WWTP to maximize the biogas as renewable energy

Project background

Energy generation is the main contributor to greenhouse gas emissions. For that reason, renewable energies, such as biomass, must play a fundamental role in climate change mitigation.

At the same time, improving waste management to achieve a completely circular economy remains another EU priority. The agri-food industries produce substantial volumes of waste, mainly organic, derived from the processing and packaging of products, and also from the cleaning of agri-food facilities. These wastes have to be treated, in most cases, at the location where they are produced or by an authorised waste manager. In some cases, the wastes enter the sewage system as a result of accidental leaks. These wastes commonly have a high water content, which increases their freight costs and makes their treatment difficult.

One alternative for treating this kind of waste is its co-digestion with wastewater treatment plant (WWTP) sludge, which neutralises the waste while producing biogas.

Spain has an available potential of 49.7 million tonnes/year of agri-food-industry waste that could be used to generate 2 600 million m³/year of biogas, equivalent to 4.2% of Spain's annual natural gas production.

Project objectives

The project will generate biogas by streamlining the co-digestion of agri-food industry waste and wastewater in a WWTP. The project will deploy in the WWTP an innovative waste dosage control technology applied in anaerobic digesters.

This new technology will also allow continuous measurement of the quantity and composition of the biogas that is generated, yielding better results through optimised digestion of both waste and sludge. On-site energy production will also minimise freight costs.

The project will design and install two prototypes: one with the new dosage and measuring technology; and one with conventional technology. In this way the new technology can be compared to the conventional approach.

LIFE13 ENV/ES/000377
LIFE ECodigestion



Beneficiary:

Type of beneficiary

Public enterprise

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Name of contact person

Gloria FAYOS

Duration of project:

35 months (01/09/2014 – 31/07/2017)

Total budget in euro:

1,027,536.00

EC contribution in euro:

438,671.00

Themes: Climate change – Energy: Energy supply / Waste: Agricultural waste - Waste use / Water: Waste water treatment

Expected results

- A 20% increase in biogas production through the most favourable waste and mixture dosage. Energy production at pilot scale is expected to be 115.59 MWh/year, equivalent to an annual greenhouse gas emissions saving of 27.97 tonnes of CO₂;
- A minimum 8% increase in the content of methane in the biogas;
- An increase in the capacity of waste co-digestion by 60%, resulting in further reductions in greenhouse gas emissions.
- Greater stabilisation of the sludge, with reduced content of metals, meaning the sludge can be re-used as an agricultural fertiliser; and
- A 30-35% increase in the self-supply energy capacity of the WWTP, and optimisation of biogas production according to the energy demand of the plant, producing more biogas when demand is higher and less when demand is lower, thereby avoiding excess production that exceeds the storage capacity of the plant.

Reduction of exposure of cyclists to urban pollutants

Project background

Promoting bicycles as a means of everyday transportation, e.g. to and from work, is economically viable and environmentally sound. It contributes to improved quality of life, reduces traffic congestion and improves the overall health of cyclists (as a direct effect of exercise) and non-cyclists (through cleaner air).

Project objectives

The main goal of LIFE+ RESPIRA is to demonstrate that the urban air pollution intake by cyclists and pedestrians can be reduced by using new technologies and other options in urban planning, urban design and mobility management.

The project will carry out the following actions in the city of Pamplona:

- Analysis of air quality and urban cycling;
- Design and development of data-processing tools (modelling, GIS, data management plan) to process information gathered in the previous step. These tools will be used to provide updated information to urban planners and managers, and as a public source of information on air quality;
- Development of air-quality monitoring prototypes to quantify the amount of pollutants inhaled by cyclists. These will include a high-precision portable sensor for air pollutants (NO, NO₂, CO, CO₂), portable structures for mask testing, and complementary equipment such as particle and black carbon analysers;
- Monitoring traffic-related pollutants using a dense mesh of mobile sensor platforms to be carried by volunteers while cycling, and fixed sensors and other equipment;
- Development of a “healthy route planner” app that will assist cyclists in choosing less-polluted routes;
- Construction of 300 m² of photo-catalytic pavement and the assessment of its effects in reducing air pollutants;
- Assessment of the efficacy of protective masks currently on the market; and
- The preparation of a cycling mobility plan for Pamplona. This plan will establish air quality criteria and recommendations for future urban planning.

Expected results

- Precise knowledge of the local time and space distribution of air pollutants in cities;
- Estimates of the health risks associated with traffic pollution, specifically for cyclists, taking into account weather, time, traffic conditions and, in particular, cycling options (e.g. routes taken);

LIFE13 ENV/ES/000417
LIFE+ RESPIRA



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Iñigo URIARTE-PUEYO

Duration of project:

36 months (01/06/2014 – 31/05/2017)

Total budget in euro:

2,330,760.00

EC contribution in euro:

1,122,530.00

Themes: Air and Noise: Air pollutants - Air quality monitoring / Land-use and Planning: Urban design / Risk management: Risk assessment and monitoring

- Assessment of the effectiveness of pollutant-reduction technologies and management options for reducing pollutants that are inhaled;
- Estimates of the environmental, health, carbon footprint and economic benefits of a shift to cycling as a transportation option;
- Development of a spatially-explicit model for air pollutants under various scenarios that can be adapted to other similar cities;
- Development of information tools (GIS, data management plan) for data processing and application;
- Development of a “healthy route planner”, enabling citizens to select the least-polluted route for cycling between two points; and
- Transfer to citizens and city planners information on air quality, and on the benefits of healthy transportation, the risks associated with air pollution and options for more sustainable living.

Eco-efficient technologies development for environmental improvement of aquaculture

Project background

Around 50% of the fishing products consumed in the world today come from marine aquaculture and this production is expected to increase more than 20 times by 2050 (FAO, 2010).

The EU will need to increase its number of aquaculture facilities to meet increasing demand from EU citizens and likely decreasing exports from developing countries looking to supply their internal markets. The main environmental impacts of aquaculture relate to energy and water consumption, use of raw materials and eutrophication of water systems due to the discharge of pollutants.

Project objectives

AQUASEF aims to demonstrate, promote and disseminate the use of efficient and innovative, low-emission technologies in the aquaculture sector, especially the inshore modality. The project will focus on implementing technologies to increase the environmental sustainability of the cultivation cycle of fish and salt water molluscs, reducing its carbon footprint and on improving water quality.

Project measures will reduce the energy dependence of the facilities, the oxygen dependence of the tanks, and the overall environmental impact in water ecosystems through effluent treatment and CO₂ fixation.

Specifically, the project will demonstrate:

- The possibility of optimising energy consumption by implementing best management practices and using renewable energies for three power generators (two photovoltaic and one aeolian);
- The environmental advantages of using hydrogen and fuel-cell technologies in the aquaculture sector. An electrolyser of 5 kW powered by renewable energies will be tested for the self-production of oxygen;
- Best practices for aeration and oxygenation in aquaculture (high efficiency aerators will be installed); and
- Possibilities of fixing the CO₂ emitted by autochthonous microalgae cultivation and how microalgae have an added value as food for fish and molluscs and in the purification of effluents.

Expected results

- Reduced greenhouse gas (GHG) emissions from the aquaculture facility by 46.6 tonnes of CO₂ per year

LIFE13 ENV/ES/000420
LIFE AQUASEF



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

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Rafael BERRUEZO

Duration of project:

37 months (02/06/2014 – 30/06/2017)

Total budget in euro:

1,899,318.00

EC contribution in euro:

919,744.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Energy supply – Reduction of greenhouse gases emissions / Industry-Production: Agriculture - Fisheries / Water: Water quality improvement

by using renewable energy sources to cover at least 10% of the energy demand;

- Reduced GHG emissions by 56 tonnes CO₂ per year through the implementation of energy-efficiency measures in the operation and control of the equipment, reducing the energy consumption of the plant by 20%;
- Increased efficiency by self-production of oxygen through renewable sources (hydrogen cell), producing energy savings of 15.878 kWh/year and reduced GHG emissions by 4.72 t CO₂ /year;
- Improved diet of fish and molluscs thanks to the addition of microalgae making it unnecessary to supply additives, which generate residues on the water tanks;
- Fixing of the CO₂ emitted in the gases, combustion by canalising and supplying this CO₂ to the microalgae cultivation tanks; and
- A good practice guide on the implementation of new technologies in aquaculture facilities.

Use of CO₂ as a substitute of chlorine-based chemicals used in O&M industrial processes for macrofouling remediation

Project background

Combined-cycle power plants located on the coast generally use seawater for their cooling processes. This can lead to *biofouling* – growth of flora and fauna on surfaces – which can be *micro* or *macrofouling*, depending on the size of the organisms.

Macrofouling is a problem for industrial facilities. To eliminate the organic matter, chlorinated compounds are generally used. For example, the consumption of sodium hypochlorite in a plant varies from 700 to 1 500 tonnes/year. Despite preventive measures to avoid the discharge of these compounds into water, they cause significant problems in the environment due to their persistence, slow degradation and great potential for accumulation.

Project objectives

The CO2FORMARE project will demonstrate that it is possible to use carbon dioxide from the flue gas of industrial facilities located close to the sea as a replacement for the chlorinated products used in these facilities against biofouling. Dangerous substances will be reduced or even completely removed, and the atmospheric emissions of these gases will be reduced because the CO₂ will be captured and re-used.

The project will be carried out in the Iberdrola Combined Cycle Gas Turbine (CCGT) plant in Castellón, where the CO₂ will act as an inhibitor of macrofouling. The results will be fully replicable in similar industrial sectors.

More specifically, the project aims to:

- Assess the concentration of organisms in seawater used for cooling;
- Inhibit the settlement and development of the organisms, through a moderate pH decrease in the seawater used as a coolant, using a CO₂ dosage in the water; and
- Produce water streams with different saturation values of CO₂ for the CCGT plant cooling unit.

Expected results

- A system that allows CO₂ to be captured and used in seawater at different concentration values;
- Reduction in the use of chlorinated compounds by 4 500 tonnes during a three-year period; and
- The capturing and re-use of 150 000 tonnes of CO₂ during a three-year period. Initial estimates indicate

LIFE13 ENV/ES/000426
LIFE CO2FORMARE



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

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Elías RODRÍGUEZ

Duration of project:

42 months (01/06/2014 – 30/11/2017)

Total budget in euro:

4,064,144.00

EC contribution in euro:

1,953,422.00

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies / Risk management: Industrial risks - Hazardous substances - Pollutants reduction / Water: Water quality improvement

that 50 000 tonnes of CO₂/year (with an approximate consumption of 3-8 tonnes/hour) could be used from the power station.

Demonstration of new natural dyes from algae as substitution of synthetic dyes actually used by textile industries

Project background

Textile industries use vast volumes of different mostly synthetic dyes. Synthetic dyes can pose many environmental problems, due to the abundance of hazardous chemicals (alkalis, acids, solvents, etc.) associated with these dyes. Large volumes of hazardous waste and wastewater are produced from many textile processes using synthetic dyes. According to the World Bank, dyeing industries produce 20% of the industrial polluted water. Natural dyes, however, tend to be clinically safer than synthetic dyes because they do not normally produce hazardous risks and possess better biodegradable characteristics. Obtaining natural dyes is more complex and also implies more time and resources (one kg requires around 1 230 ha of farmland), making them an uncompetitive option.

Project objectives

The main objective of the LIFE SEACOLORS project is to demonstrate and validate a new process for obtaining natural dyes from a sustainable and renewable source – algae. The project will also test and assess the possibilities of using these new natural dyes to replace synthetic dyes in the textile industry.

Environmental benefits from biodegradable dyes are anticipated, including less polluted wastewater and reduced water purification demand. Such benefits will help reach the goals of EU legislation covering wastewater (e.g. Directive 2008/105/CE and the REACH regulation).

The project will achieve its aims by: selecting algae with high dye capacity and potential for mass cultivation; improving the algae's dye content through optimising their growth conditions; studying the extraction conditions to optimise the amount of dye obtained; comparing different dyeing process and auxiliary substances needed to obtain satisfactory results; and assessing the 'fastness' of the obtained natural dyes compared with synthetic dyes.

In order to substitute synthetic dyes, the new solution must be able to provide a wide range of colours, and consequently a high variety of shades. To fulfil this aim within the project timespan, the consortium will focus on a mixture of three colours (red, yellow and blue) and from these develop other colours in the chromatic scale.

Expected results

- A selection of algae species (25 different strains of microalgae/cyanobacteria and 10 different species of

LIFE13 ENV/ES/000445
LIFE SEACOLORS



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Miriam MARTÍNEZ

Duration of project:

30 months (01/07/2014 – 31/12/2016)

Total budget in euro:

697,273.00

EC contribution in euro:

348,635.00

Themes: Environmental management: Cleaner technologies - Eco-products design / Industry-Production: Textiles – Clothing / Risk management: Industrial risks: Hazardous substances - Pollutants reduction / Waste: Hazardous waste - Industrial waste - Waste reduction - Raw material saving / Water: Water quality improvement

- macroalgae) with potentially high dyeing properties;
- Optimal procedures for growing the algae, increasing their production of dyes and extracting their natural pigments for use as alternatives to synthetic dyes;
- A new dyeing process using the new products tested and validated at a semi-industrial level;
- Legislated dilution of 1/40 of the targeted pollutants without the need for further purification;
- Lower final cost of the process due to savings created from reduced wastewater purification costs (despite the higher cost of producing the new natural dye); and
- Viability of using the new dye production process in other sectors, e.g. food, cosmetics and fertilisers assessed.

In-Farm remediation by solar photocatalysis of agro-waste water with pesticides from remnants, cleaning and rinse

Project background

During 2012, 91 983 tonnes of pesticides were applied in Spain, of which 8 429 tonnes were applied in Murcia. A total of 250 055 hectares was cultivated in 2012 in Murcia, and more than 60 000 cubic metres of agro-waste water was produced (average 240 litres/ha), in particular from the cultivation of crops to which pesticides are intensively applied.

The EU Directive on the Sustainable Use of Pesticides (2009/128/EC) requires Member States to adopt measures to ensure that the activities of professional pesticide users and, where applicable, distributors do not endanger human health or the environment. But no real solution is currently available enabling farmers to manage pesticide residues, though there are some recommendations. Current practices and others that are being tested are not fully adequate.

Project objectives

The project will demonstrate a technically, economically and ecologically feasible method by which pesticide residues contained in the waste water produced by farms can be neutralised. The use of innovative equipment will allow pesticide remnants in containers and treatment tanks and rinse water from tanks after cleaning of machines and equipment to be dealt with.

The project will develop a pilot waste-water decontamination facility to be tested on five farms. It will use a solar photocatalysis degradation process. The system uses solar energy (UV irradiation), sodium peroxodisulphate ($\text{Na}_2\text{S}_2\text{O}_8$) and a catalyst (TiO_2 and ZnO). The catalyst is recovered at the end of the process for its re-use. Treated waste water is no longer contaminated and can be used again for any purpose (e.g. irrigation).

Expected results

The main result of the project will be the development of an on-site waste-water decontamination plant able to completely degrade pesticides without generating any other residue.

The main expected long-term achievement of the project is the implementation of the Aquemfree system in medium-size and large farms, which would provide a solution for 80-90% of this environmental problem, at least in Mediterranean farms thanks to their solar irradiation conditions.

LIFE13 ENV/ES/000488

LIFE-Aquemfree



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

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Name of contact person

Fulgencio CONTRERAS LOPEZ

Duration of project:

48 months (01/07/2014 – 30/06/2018)

Total budget in euro:

1,863,566.00

EC contribution in euro:

911,356.00

Themes: Environmental management: Cleaner technologies / Industry-Production: Agriculture – Fisheries / Risk management: Pollutants reduction / Water: Waste water treatment

Innovative eco friendly traps for the control of Pine Lepidoptera in urban and recreational places

Project background

The pine processionary (*Thaumetopoea pityocampa*) and pine tree lappet (*Dendrolimus pini*) are moths found in abundance in pine woods in north, central and southern Europe. Because their larvae, or caterpillars, feed on the needles of pine trees and other conifer tree species, the species are considered a pest. Also, caterpillars represent a public health hazard because they have thousands of hairs which contain an urticating, allergenic or irritating protein called thaumetopoein.

Fumigants and synthetic pesticides can be used to control these pests, but they are often not suitable for urban places with a limited number of pines (parks, school yards, recreational forest, etc.) due to their potential to cause an allergic or toxic reaction in people, pets and urban wildlife.

Project objectives

The project's main objective is to demonstrate an alternative approach to controlling the target pests. Activities will be carried out in four countries (Greece, Italy, Spain and UK) and focus on improving the effectiveness of trapping systems that can be used in a range of urban situations.

An updated review of environmental and health problems will be initially carried out, (as well as associated EU legislation) regarding the control of metropolitan pine pest problems. Results will inform the design and manufacture of new trap system prototypes, including:

- An innovative barrier that prevents the caterpillars reaching ground level (thereby cutting their life cycle and preventing reproduction). This barrier will be made of recycled thermoplastic material with pine sawdust to extend the device's long-term durability and to appear similar to wood; and
- Redesigned pheromone traps with new textures and colours that improve the efficiency of current traps in the selected countries.

In addition, the project will design and produce prototype versions of new mating disruption (MD) systems that interfere with the male's ability to find a female, resulting in reduced mating and egg-laying by females.

Expected results

- Decreased population of pine processionary and pine tree lappet in the project sites, by at least 30% without the use of chemical pesticides;

LIFE13 ENV/ES/000504
LIFE PISA



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Santiago GÁLVEZ SETTIER

Duration of project:

36 months (01/07/2014 – 30/06/2017)

Total budget in euro:

1,118,232.00

EC contribution in euro:

554,116.00

Themes: Biodiversity issues: Urban biodiversity / Habitats: Forests / Land-use and Planning: Forest management - Urban design / Risk management: Human health protection - Pollutants reduction

- Significant reductions in irritating injuries and allergic symptoms from the pests to children, adults and animals (mostly pet dogs);
- Reduced negative impacts on urban trees from conventional treatments;
- Updated analysis of the current control system of pine processionary in Greece, Italy and Spain, as well as the pine tree lappet in Scotland;
- Development of trapping devices (trunk barrier, MD and pheromone traps systems) and related equipment with improved performance, high weather resistance, easy installation and lower cost than current ones (from €33-40 to €25/device); and
- Drawing up of guidelines on the use of the project devices.

Implementation of efficient irrigation management for a sustainable agriculture

Project background

The Guadalquivir river basin is in the south of Spain with a surface area of 57 527 km², including parts of four regions: Andalusia, Castilla-La Mancha, Extremadura and Murcia. Rains in the area are often torrential and fall on lands recurrently affected by long periods of drought and high temperatures, and that have a marked susceptibility to erosion. In the basin, there are numerous protected areas for the conservation of habitats and species directly depending on the water. In the Guadalquivir basin, there is chronic water scarcity.

The Segura river basin is located in the southeast of Spain, with a surface area of about 18 870 km², and covering four regions. Average annual rainfall is about 400 mm. The Segura river basin is the most water deficient in Spain and the wider EU, with a structural water deficit of about 460 hm³ per year. The amount of water is insufficient to meet consumption.

Project objectives

The project aims to implement an efficient irrigation management schedule for two areas in the Segura Basin and one in the Guadalquivir basin. The project will demonstrate and disseminate a sustainable irrigation strategy for use with woody crops in Mediterranean agro-ecosystems. The strategy will be based on reduction of water supply during non-critical periods, the covering of water needs during critical periods and maximising yields per unit of applied water.

The project will implement demonstration plots where sustainable irrigation protocols will be applied. Different cropping zones will be selected with the most representative fruit trees, including peach, grape, citrus, apricot and almond.

More specifically, the project will have three phases:

- Installation of sensors to measure soil and water status in different fruit trees;
- Using data from the sensors, the beneficiary will develop a series of sustainable irrigation schedules depending on the type of cultivation and the area;
- Once the sustainable irrigation models have been created, the project will assess:
 - The environmental effects of sustainable irrigation in terms of water and energy consumption, runoff water quantity and quality, water leaching depth, NO₃ leaching and the capability of the soil to fix carbon;

LIFE13 ENV/ES/000539
LIFE+ IRRIMAN



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Name of contact person

Alejandro PÉREZ-PASTOR

Duration of project:

40 months (01/09/2014 – 31/12/2017)

Total budget in euro:

1,713,654.00

EC contribution in euro:

840,193.00

Themes: Industry-Production: Agriculture – Fisheries / Risk management: Pollutants reduction / Water: Water resources protection - Water saving - Water scarcity and draught

- Vegetative growth and crop yield so irrigation can be adjusted at any time; and
- Crop yields and the final fruit quality at harvest.

Expected results

- Reduction by 30% in water used for irrigation, compared to the current irrigation regime;
- Reduction in the use of chemical fertilisers by 30%;
- Reduction in irrigation system energy consumption by 30% because of pressurisation; and
- Reduced CO₂ emissions:
 - By 30% as a result of the reduced energy consumption; and
 - By a further 40% because of the reduction in soil CO₂ flux rates.

Best agricultural practices for Climate Change: Integrating strategies for mitigation and adaptation

Project background

According to the European Environment Agency, agriculture is the fourth highest greenhouse gas emitting sector in the EU, accounting for 9.9% of GHG emissions in 2011. The agricultural sector, moreover, is particularly vulnerable to the effects of climate change. Consequently, the sector faces the challenge of mitigating climate change and adapting to the new scenarios that emerge as a result of global warming. One of the challenges of CAP 2020 is to take full advantage of the potential of agriculture to mitigate climate change and adapt to its consequences, as well as to increase the positive contribution the sector makes towards enhancing energy efficiency and carbon capture and sequestration. To achieve this outcome, European authorities must be informed about the mitigation and adaptation practices that have already been studied on an experimental level in order to validate them jointly in pilot demonstrations.

Project objectives

The aim of this project is to demonstrate the viability and environmental benefits of agricultural management systems for irrigated farming in the Mediterranean Basin based on integrated climate change mitigation and adaptation measures. Specifically, the project aims to:

- Define monitoring indicators;
- Implement measures on 12 farms in four Member States (three per country): France, Italy, Portugal and Spain. These farms will form a 'European Network of Demo Farms' that will serve as a platform for coordinating measures and sharing results, findings and good practices;
- Create a GIS (Geographic Information System) software tool for the efficient working of this network; and
- Draw up a guide of good agricultural practices based on the results and findings of the project.

Expected results

- Reduction of energy consumption by 20% due to the following actions:
 - Implementation of efficient fertilisation practices;
 - Implementation of efficient phytosanitary products;
 - Elimination of the tilling.
- Reduction of CO₂ emissions from energy use by 20%;
- Reduction of CO₂ emissions from soils by at least 40%;
- Reduction of N₂O emissions by 35%;
- Increase the carbon sinking capacity of the cultures implemented by at least 35%;

LIFE13 ENV/ES/000541

Life+ ClimAgri



Beneficiary:

Type of beneficiary

NGO-Foundation

Name of beneficiary

Asociación Española Agricultura de Conservación.
Suelos Vivos

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Name of contact person

Emilio GONZÁLEZ-SÁNCHEZ

Duration of project:

55 months (01/06/2014 – 31/12/2018)

Total budget in euro:

2,246,119.00

EC contribution in euro:

1,121,786.00

Themes: Climate change – Energy: Adaptation to climate change - Energy efficiency - Energy saving - Reduction of greenhouse gases emissions / Industry-Production: Agriculture – Fisheries / Land-use and Planning: Soil and landscape protection / Risk management: Pollutants reduction

- Improve knowledge about the distribution of organic carbon in soils depending on the management technique used; and
- A handbook with technical recommendations for adopting the best agricultural practices that simultaneously mitigate climate change and allow farms to adapt their crops to the climate scenarios expected.

Air pollution treatment in European urban environments by means of photocatalytic textiles

Project background

Air pollution from traffic is a growing problem, especially in urban areas. In recent years, the use of titanium dioxide (TiO₂) based photocatalytic self-cleaning and depolluting materials has been considered to remove these pollutants. TiO₂ is now commercially available and used in construction material or paints for environmental purposes. Further work, however, is still required to clarify the potential impacts from wider TiO₂ use. Specific test conditions are required to provide objective and accurate knowledge.

Project objectives

The aim of the PHOTOCITYTEX project is to assess the effectiveness of using TiO₂-based photocatalytic nano-materials in building textiles as a way of improving air quality in urban areas. Moreover, information on secondary products formed during the tests will be obtained, yielding a better overall understanding of the whole process and its implications.

Specifically, the project aims to:

- Review the current technologies available and identify photocatalytic compounds that are suitable for use with textiles;
- Review European legislation related to the concentration of pollutants in urban environments to establish large-scale demonstration conditions;
- Develop textile prototypes on a semi-industrial scale in the form of awnings and wall coverings;
- Demonstrate on a large scale the use of photocatalytic textiles for the depollution of urban environments by employing EUPHORE chambers (half spherical Teflon bags with a confined volume of air of about 200 m³, where representative European atmospheric conditions can be simulated using natural sunlight);
- Acquire information on secondary products formed during the tests;
- Install the photocatalytic textiles at two urban locations in Quart de Poblet; and
- Draw up a guide that establishes a common methodology for the application of photocatalytic textiles in polluted environments.

Expected results

- Demonstration of the effectiveness of photocatalytic textile in order to reduce the atmospheric concentration of nitrogen oxides (NO_x) to a limit lower than 40 mg/m³ established by European law;

LIFE13 ENV/ES/000603
LIFE PHOTOCITYTEX



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Amalia MUÑOZ

Duration of project:

36 months (01/07/2014 – 30/06/2017)

Total budget in euro:

1,297,105.00

EC contribution in euro:

588,938.00

Themes: Air and Noise: Air pollutants / Environmental management: Cleaner technologies / Risk management: Pollutants reduction

- Concentration of characteristic pollutants in an urban environment or in tunnels (ranging from 0.01 to 10 ppm) is compatible with photocatalytic degradation even with low ultraviolet sun radiation;
- Reduced concentrations of at least two VOCs from air in the target areas;
- Normal conditions (e.g. type of radiation) determined for each type of TiO₂ based textile to be most efficient as a pollution control agent;
- Identification of urban areas with good potential for improved air quality from addressing traffic related air pollution;
- Clarification of appropriate procedures and protocols for evaluating the efficiency of the new materials;
- Confirmation of the policy implication of the use of these new functional textiles in local, regional and European scales; and
- Cost benefit assessment to encourage local authorities and stakeholders to replicate the techniques.

Reduction of SO₂ emissions by a zero-effluent wet desulfuration process using MgO by-products

Project background

Emissions of sulphur oxides (SO_x) can cause acid rain as well as human health problems. To combat this threat, the EU has introduced several directives: Directive 2001/81/EC, covering national emissions' ceilings for certain atmospheric pollutants; Directive 2010/75/EU on industrial emissions; and Directive 93/12/EC relating to the sulphur content of certain liquid fuels. One of the industries that generate SO₂ emissions is the magnesite industry.

Energy generation using fossil fuels results in the emission of sulphur oxides (mainly SO₂ and SO₃). Such oxides in the atmosphere can also come from natural sources such as volcanic activity, forest fires and the anaerobic oxidation of hydrogen sulphide – but these only account for 25% of the total SO_x emissions.

SO₂ emissions from fossil fuel combustion reach the atmosphere and react with water vapour to form sulphuric acid (H₂SO₄), which dissolves and returns to the Earth's surface as rain. Such acid rain has a particularly negative impact on the environment. In soils, for instance, acid rain causes lixiviation and mobilisation of heavy metals, which are then incorporated into the trophic chain.

As a gas, SO₂ causes many health problems when inhaled, particularly to those who suffer from asthma. Extended exposure to SO₂ and small particles of sulphates (SO₄) is directly related to lung cancer, asthma and cardiopulmonary obstruction.

Project objectives

The main objective of the LIFESO2ZEROEF project is to demonstrate the viability of innovative and environmentally friendly wet desulphurisation technology for the treatment of gases produced by calcination furnaces in the magnesium oxide (MgO) industry. This technology uses an alkaline MgO-based solution to absorb the SO₂, producing solid MgSO₄ as residue.

To meet this aim, the project will build a wet desulphurisation demonstrative industrial pilot plant in one of the beneficiary's magnesite calcination rotary furnaces with a capacity of 60 000 Nm³/h. The project will also assess the valorisation of the residual MgSO₄ as raw material for the fertiliser industry.

LIFE13 ENV/ES/000605
LIFESO2ZEROEF



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

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Belén ZARRANZ

Duration of project:

25 months (02/06/2014 – 30/06/2016)

Total budget in euro:

2,535,288.00

EC contribution in euro:

855,144.00

Themes: Air and Noise: Air pollutants / Environmental management: Cleaner technologies / Industry-production: Metal industry / Risk management: Pollutants reduction / Waste: Waste use

Expected results

- New methodology for reducing SO₂ emissions by wet desulphurisation that is able to treat 60 000 Nm³ of combusting gases per hour;
- Reduction of SO₂ emissions in the manufacturing process of the magnesite below a threshold of 400 mg/Nm³ (reduction of 75% over currently used dry procedures);
- Evaluation of the potential value of MgSO₄ as a fertiliser; and
- Development of a sustainability model for SO₂ emissions for magnesite industry and related sectors.

Reduction of CO₂ emissions by the PHB use obtained from whey: demonstration in dairy products packaging

Project background

The food-packaging market remains dominated by petrol-based plastic (99% market share), but there is a growing market for bio-based plastic produced from renewable resources. The global production of bioplastic could reach 5.8 million tonnes in 2016, up from 1.2 million tonnes in 2011.

One by-product of the agri-food industry that could be used in packaging production is whey from cheese-making (around 9 tonnes of whey per tonne of cheese). Whey is mostly water (around 85% weight/volume) and contains the solids present in whole milk, including whey proteins (20% of total proteins), and most of the lactose, water soluble vitamins and minerals. EU27 whey production is about 50 million tonnes. At present, most is used to produce whey powder, which is used as a dietary supplement, but the quantities of whey produced surpass by far the demand for whey powder.

Project objectives

The WHEYPACK project will demonstrate the environmental and socio-economic benefits of producing a biodegradable food packaging material using polyhydroxybutyrate (PHB), which is obtained from whey. PHB will be produced using a process of microbial fermentation.

In particular, the project will:

- Demonstrate the environmental, technical and economic feasibility of:
 - PHB bioproduction from whey;
 - Polymer compounding; and
 - Development of partly biodegradable PHB-based packages (trays) and demonstration of their application to dairy products e.g. as cheese packaging;
- Demonstrate that total greenhouse gas emissions from the new production process are lower than from manufacturing of petrol-based food packages (polypropylene, PP);
- Assess energy and water consumption; and
- Study the conditions for scaling up of the process from pilot to industrial scale.

Expected results

- A PHB-based packaging manufacturing process (using whey) that has a carbon footprint 35% lower than PP-based packaging manufacturing;
- A 75% reduction in BOD (biological oxygen demand) and a 40% reduction in COD (chemical oxygen

LIFE13 ENV/ES/000608
LIFE+ WHEYPACK



Beneficiary:

Type of beneficiary

Professional organisation

Name of beneficiary

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Duration of project:

30 months (01/06/2014 – 30/11/2016)

Total budget in euro:

1,188,777.00

EC contribution in euro:

584,888.00

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Environmental management: Eco-products design / Industry-Production: Food and Beverages / Waste: Packaging and plastic waste - Waste use / Water: Water quality improvement

- demand) of the 'industrialised' whey by-product (after its use for PHB production) when compared with original whey by-product without treatment;
- Reduction in the production cost of PHB polymer of up to 50% because of the use of dairy by-products (revalorisation of whey surplus), instead of purpose-grown crops as raw materials; and
- Production of 100% biodegradable packages (200 pilot units) based on PHB polymer obtained by injection moulding processes (trays), which will be used for dairy products (cheese).

Prevention of dairy product's environmental impact through ecodesign

Project background

Around 80% of most products' environmental footprint is determined during their design phase. Focusing on environmental considerations during design stages can therefore reduce negative impacts and increase resource efficiency.

European dairy products have lifecycles that traditionally consume large amounts of energy and other resources. This sector has great potential to become more resource-efficient through adoption of more holistic environmental perspectives throughout the product lifecycle. Currently, eco-design approaches have focused mainly on primary production and the final packaging phases. Further benefits can be gained by integrating more environmental perspectives along the entire product chain.

Project objectives

The project's primary aim is to reduce negative environmental impacts from the production of dairy products. Reaching this objective will help enhance the environmental competitiveness of agri-food companies, especially dairies. A core aim is to provide the dairy industry with an ICT tool for analysing the environmental impacts of its production processes.

The project will carry out a life cycle analysis (LCA) of the dairy industry in order to identify priority areas and key opportunities for improving environmental performance. It will also develop a new ICT software tool that will provide companies in the dairy sector with data on the environmental impacts of their production processes. The aim is to foster the implementation of eco-design approaches in the dairy industry by providing information on different indicators (e.g. carbon footprint, water footprint, ozone layer potential depletion, loss of biodiversity, etc.).

The prototype will be tested and validated on six different dairy products and a manual of good practices in eco-design applications for food products will be produced. A study will also be carried out on consumer behaviour concerning eco-designed food products. This study will serve as the basis for the development of future products and for raising the environmental awareness of consumers.

LIFE13 ENV/ES/000615
LIFE ECOLAC



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Duration of project:

36 months (01/07/2014 – 30/06/2017)

Total budget in euro:

1,452,503.00

EC contribution in euro:

722,122.00

Themes: Environmental management: Eco-products design - Life Cycle Assessment-Management / Industry-Production: Food and Beverages

Expected results

- A software tool for the eco-design of dairy products;
- LCA of dairy products, identifying critical points with higher environmental impact for dairy products;
- Calculations of different environmental impact indicators for six dairy products (carbon footprint, water footprint, ozone layer potential depletion, loss of biodiversity, etc.) using the newly developed tool, and identification of potential actions to mitigate them. The proposed actions are foreseen to help improve the general environmental impact of the whole process by 15% over the evaluated environmental impact;
- Production of 5000 units of one prototype at pilot scale for one dairy product, which has been developed using the new eco-design methodology;
- A new guide to eco-design of food products and good practice recommendations;
- A user manual for the new software; and
- An environmental awareness and educational campaign for dairy product consumers in the project area.

Sustainable management of shrubs formations for energy purposes

Project background

The frequency and severity of forest fires in Europe is predicted to increase as climate patterns continue to change. Forest fires can have a significant negative impact, causing great damage to the environment and large volumes of atmospheric pollution, including significant emissions of greenhouse gases (GHGs).

In Mediterranean countries, especially Spain, forest fires represent a big environmental and economic problem. According to the Spanish Ministry for Agriculture and the Environment, the average surface area affected for forest fires in the period 2002-2012 was 114 000 ha per year. In 2012, the figure was 210 000 ha. Figures indicate that around two thirds of the area affected by fires was scrubland (containing few trees).

Scrublands have a high potential as a source of bioenergy fuel. On an annual basis, some 3.75 million tonnes of biomass could be harvested sustainably from just 2% of Spain's scrubland (375 000 ha). This could substitute over 1.5 million tonnes of fossil fuel per year, reducing GHG emissions by 4.6 million tonnes of CO₂, as well as having a positive economic impact.

Project objectives

The project aims to reduce forest fire risks by removing flammable scrub biomass in a sustainable manner and converting it to solid biofuel. New methods would be developed for harvesting and processing the biofuel. Findings from four pilot sites (in Castilla-Leon and Galicia) will be compared to help identify best approaches for reducing forest fire risks. Conclusions will be widely disseminated in order to encourage replication of the good practice techniques.

Specific objectives include: sustainable harvesting of 2 000 tonnes of locally sourced biomass; demonstration of technical and economic feasibility of the supply chain of shrub biomass based on mechanised harvesting methods in four different locations; determination of quality parameters of shrub biomass (energy-chemical characterisation of 120 samples and production of eight types of standardised quality pellets); definition of operational patterns for biomass combustion in order to reach the most restrictive emission thresholds currently in force in Europe; establishment of management guidelines and policy documents for discussion by the main stakeholders; and the creation of a network of projects that have similar goals but focus on different geographical areas.

LIFE13 ENV/ES/000660
LIFE ENERBIOSCRUB



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Duration of project:

43 months (01/06/2014 – 31/12/2017)

Total budget in euro:

1,889,758.00

EC contribution in euro:

939,279.00

Themes: Climate change – Energy: Energy supply -
Reduction of greenhouse gases emissions / Habitats:
Forests / Land-use and Planning: Forest management /
Risk management: Natural risks

Overall, the project aims to make important contributions to the EU's 7th Environment Action Programme, the EU 2020 strategy and the Kyoto and Rio agreements.

Expected results

- Saving of more than 3 400 tonnes of CO₂ (compared to fossil fuel equivalents) and contribution to stable renewable energy generation;
- A consolidated document on management guidelines and policies that includes recommendations for targeted decision makers; and
- Dissemination and promotion of the project findings through a broad range of media including press, radio, television, websites, publications, seminars and layman's report.

Demonstration of Sustainable Alternatives to Chemical Products for European Crop Protection

Project background

A European Directive (2009/128/EC) has regulated the use of pesticides, establishing a framework for their sustainable use. In this context, Spain – along with the other EU countries - has drafted a National Action Plan (NAP) for ensuring compliance with the European framework. Implementation, however, remains a challenge.

Project objectives

The AGROINTEGRA project aims to promote the most innovative tools available for Integrated Pest Management (IPM) in the agricultural sector as a viable alternative to the use of chemical pesticides. To achieve this, it will demonstrate both the efficacy and environmental benefits of the available alternatives and develop practical tools to help farmers to make the transition to IPM.

The project will demonstrate the environmental benefits of implementing alternative methods of crop protection, such as the biological and integrated control of plagues and the biological efficacy of low-risk phytosanitary products. It will design and implement IPM models in three different kinds of farm systems: fruit production; vineyards; and extensive cultures – and on both irrigated and rain-fed lands. The project will develop a ‘crops guide’ to inform farmers of the most appropriate actions to be applied for different types of pest avoidance. This will be distributed to farmers, but also serve as a ‘live’ document to be updated based on the project experiences. The project will also establish an extensive network of alert points to warn farmers and help prevent the spread of pests.

The team will integrate all the information into a web-based GIS decision-making tool to help farmers decide on the most appropriate pest control methods for each specific situation, pest, disease or weed. The tool will be validated on 200 farms. The project will support this with a protocol of training and advice to help farmers with the transition to IPM. This will be applied to 500 farms during the course of the project. Finally, the project will create a permanent platform to continue promoting and supporting IPM beyond the project. The aim is to increase the number of farmers who work according to the new IPM model by an additional 500 each year.

Expected results

Main expected outputs include:

- Development of a web-based decision-making tool to

LIFE13 ENV/ES/000665
LIFEAGROINTEGRA



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

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Delia SOLA

Duration of project:

36 months (01/07/2014 – 30/06/2017)

Total budget in euro:

1,561,766.00

EC contribution in euro:

774,642.00

Themes: Industry-Production: Agriculture – Fisheries / Risk management: Pollutants reduction - Risk assessment and monitoring

help farmers identify the method of IPM that will be the most efficient in their particular situation;

- A protocol of training, advice etc., to help farmers implement IPM;
- A reduction of at least 30% in the volume of chemical protection used, as compared to the current system;
- The avoidance of phytosanitary products that pose the greatest risk, thus delivering environmental benefits beyond that suggested by a simple measurement by volume; and
- A contribution to achieving the targets set in the Spanish NAP on the sustainable use of pesticides.

Electric vehicles to grid, renewable generation and Zn-Br flow battery to storage in industry

Project background

The U.S. Lawrence Livermore National Laboratory estimates that 53 % of the energy used worldwide in 2006 could be classified as waste heat, providing no useful services. Other calculations show far higher losses. Moreover, the United States is estimated to operate at only about 13% useful-energy efficiency, up from 10%. Even in Japan, a worldwide efficiency leader, the rate at which primary energy actually provides useful work or heat is only about 20%. Such waste poses a great obstacle to reaching the objectives on energy efficiency, renewable energies and CO₂ emissions set out in European and national legislations.

Microgrid systems are localised groupings of electricity generation and energy storage that are normally connected to a traditional centralised grid. This single point of common coupling with the macrogrid can be disconnected, allowing it to function autonomously. Microgrids are able to reduce transmission losses and increase the efficient use of electricity and heat. Generation resources for microgrids can include fuel cells, wind and solar, among others.

Project objectives

The main objective of the LIFE FACTORY MICROGRID project is to demonstrate that microgrids are a viable means of generating electricity for industry, especially in areas with a high share of renewable energy sources. To achieve this objective, the project aims to:

- Install renewable energy sources: a 100 kW wind turbine and a 40 kW solar photovoltaic device;
- Install a novel technology of ZnBr (Zinc/Bromine) flow batteries to store 500 kWh of electricity. These batteries have several advantages over conventional Li-ion (lithium ion) batteries in terms of economies of scale and system lifetime;
- Install six bidirectional charging points to be used for a fleet of six electric vehicles (three cars, two vans and one minibus);
- Establish one fast-charging station for electric vehicles with a power of 50 kW; and
- Test and demonstrate energy-management strategies that use all the renewable energy generated and reduce energy consumption by managing dispatchable loads of up to 100 kW.

LIFE13 ENV/ES/000700
LIFE FACTORY MICROGRID



Beneficiary:

Type of beneficiary

Large enterprise

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Duration of project:

36 months (01/07/2014 – 30/06/2017)

Total budget in euro:

1,987,462.00

EC contribution in euro:

854,087.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Energy supply - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies

Expected results

- Generation of 56 215 kWh/year free of CO₂ emissions due to the installation of 40 kWp of photovoltaic panels;
- Generation of 103 323 kWh/year free of CO₂ emissions due to the installation of 100 kWp of wind turbines;
- Store of energy and management of energy flows in order to consume all renewable energy generated, saving 35.4 million tonnes of CO₂ emissions;
- Saving of 38 million tonnes of CO₂ emissions by using electric vehicles as part of the microgrid;
- Reduction of energy consumption due to energy management of 100 kW of dispatchable loads, allowing a reduction of 23 million tonnes of CO₂ emissions per year; and
- More grid stability, allowing for an increase of renewable energy generation to more than 40% by 2020.

New demonstrative pilot plant for the recycling of NdFeB magnets from discarded HDDs

Project background

Currently most waste electrical and electronic equipment (WEEE) is incinerated or sent to landfill. This waste stream needs to be correctly managed to prevent the release of the many toxic compounds in WEEE into the environment. Spain produces about 200 000 tonnes of WEEE per year. This waste is also rich in scarce natural elements for which there is market demand.

One such element is the rare earth metal neodymium (Nd), a basic component of the neodymium magnet (NdFeB), which is used in the production of hard disk drives (HDD). Nd is a very scarce element, and 97% of reserves are found in China. The extraction of Nd, like most rare earths, is complex and environmentally harmful.

Project objectives

Studies have shown that about 35% of the rare earths contained in NdFeB magnets in HDD can be easily recovered. The main objective of the LIFE RECYMAGNET project is to design and demonstrate a pilot plant with a treatment capacity of 75 HDD/h which will be able to recycle NdFeB magnets from discarded HDDs and recover up to 80% of their active magnetic materials.

The pilot plant will be divided into two modules: the first will shred the HDD and detect and extract NdFeB magnets; the second will include demagnetisation, size reduction and screening, and purification by magnetic separation, producing a powder. The use of the powder will be demonstrated by using it to directly manufacture recycled NdFeB magnets.

The project will also test the powder in the production of liquid precursors for flame spray pyrolysis and, subsequently, nanoparticles of the mixed oxide in the proper composition, which will be then used to produce a nano-based magnet.

Expected results

- Design and development of a demonstration plant with a recycling capacity of 75 HDD/h, and the capability to recover up to 80% of the rare earth content of NdFeB magnets in HDD, with a purity of over 95%;
- An 85% weight reduction of the waste produced from shredding and processing HDDs, as a result of the magnet-detection device that allows more accurate separation of the material; and

LIFE13 ENV/ES/000703
LIFE RECYMAGNET



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Claudio FERNÁNDEZ

Duration of project:

42 months (01/09/2014 – 28/02/2018)

Total budget in euro:

1,426,007.00

EC contribution in euro:

688,753.00

Themes: Industry-Production: Electric - Electronics - Optical / Waste: Waste from Electrical and Electronic Equipment (WEEE) - Waste reduction - Raw material saving

- A methodology for producing NdFeB mixed-oxide nanoparticles to be used in the production of nano-based recycled magnets.

Optimised Renewable Mix for Energy Saving in Waste Water Treatment Plants

Project background

Treatment of waste water is necessary to prevent pollution from being discharged into water courses. It can also provide water that is clean enough for re-use in certain contexts, which can be particularly useful in areas suffering from water stress.

However, re-use of treated water is currently restricted by the fact that it is often more expensive than drinking water. This is largely due to the high energetic demand of waste water treatment plants (WWTPs). WWTPs in the EU consume around 10 000 GWh/year of mains electricity. Furthermore, the volume of waste water being treated in the EU is increasing by around seven per cent each year.

Project objectives

The LIFE RENEWAT project aims to demonstrate the use of sustainable technologies for reducing the mains energy demand of WWTPs. The project thus seeks to reduce both greenhouse gas (GHG) emissions associated with the treatment of waste water and the costs of water treatment, making treated water a more viable option for a range of uses.

Specifically, RENEWAT plans to demonstrate an intelligent system for applying a renewable energy mix in WWTPs. The project will follow three main stages, involving:

1. Adapting the WWTP process to a new energy input from a renewable mix, including, small-scale (less than 10MW) photovoltaic (PV) and wind energy sources;
2. Using the renewable sources (PV and wind) in the WWTP; and
3. Developing an intelligent system capable of managing the input of energy from the different sources.

The intelligent system will discriminate between the energy input sources – PV, wind or grid – aiming to provide the optimum energy mix, depending on the environmental and weather conditions. It will also regulate the overall energy input according to the precise demand of the WWTP at every stage of the process.

The project thus expects to reduce the consumption of electricity from the grid as much as possible. This will reduce the carbon emissions associated with wastewater treatment. It will also reduce the price of treated water

LIFE13 ENV/ES/000704
LIFE-RENEWAT



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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José Daniel GARCÍA ESPINEL

Duration of project:

36 months (01/07/2014 – 30/06/2017)

Total budget in euro:

1,366,044.00

EC contribution in euro:

621,362.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Energy supply - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies / Water: Waste water treatment

and represent a first step in terms of boosting the re-use of treated water, for example in agricultural and landscape irrigation.

Expected results

- An intelligent system allowing for the optimal use of renewable energy sources in WWTPs;
- A 30% decrease in consumption of electricity from the grid by WWTPs;
- A 24% reduction in the cost of treated water - from 0.4 €/m³ to 0.3 €/m³;
- A reduced carbon footprint of WWTPs, by about 45 tonnes CO₂/yr for every 100 kW obtained from renewable sources; and
- The potential to apply the intelligent system in 99% of the EU's WWTPs, saving millions of tonnes of CO₂ emissions and promoting the re-use of treated water.

Implementation of Demonstrative & Innovative Strategies to reduce the use of phytosanitary products in viticulture

Project background

Pesticides are used in viticulture to maintain a good level of pest prevention in vineyards. Fungicides are applied to control fungal pathogens that can cause devastating diseases, such as grapevine downy and powdery mildews.

Treatment of these diseases generates resistance in pathogens, which can result in application of higher doses and use of more aggressive fungicides, which in turn increases the exposure of growers to these compounds. The presence of toxic molecules in grapes and wine can also increase and be ingested by those who consume these products. They also have negative impacts on the surrounding environment, particularly soil and water.

Project objectives

The project will demonstrate that a reduction in the negative environmental impacts from the production of grape, juice and wine can be achieved by:

- Evaluating new management strategies to control downy and powdery mildews by reducing the number of treatments in endemic Atlantic and Mediterranean areas;
- Evaluating the action of 'zero residue' fungicides as alternatives to conventional products;
- Comparing the results of new treatment strategies in different climatic areas with different characteristics (topography, grape varieties, etc.);
- Creating awareness among users about the importance of correct maintenance and use of spray application equipment, and its effect on the efficiency of pesticide application;
- Using mandatory inspections of sprayers to provide training and information to users;
- Analysing fungicide residues in grapes, juice and wine, in different pesticide application scenarios;
- Evaluating the environmental and socioeconomical impacts of grape production; and
- Improving the efficiency of pesticides by demonstrating an imaging device that can detect fungal disease in its early stages, enabling early treatment.

Expected results

- Comparison of the current approach to control of downy and powdery mildews with alternative treatment strategies;
- Demonstration that the number of fungicide applications to control mildews can be reduced by one third through smarter application;

LIFE13 ENV/ES/000710
LIFE FITOVID



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Duration of project:

37 months (01/09/2014 – 30/09/2017)

Total budget in euro:

1,428,885.00

EC contribution in euro:

711,470.00

Themes: Environmental management: Cleaner technologies / Industry-Production: Agriculture – Fisheries – Food and Beverages / Risk management: Pollutants reduction

- Comparison of the effectiveness of pesticide application using a carefully adjusted and inspected sprayer with real-world scenarios;
- Implementation of a programme to make growers aware of the necessity of calibrated spraying equipment;
- Use of correctly maintained equipment contributing to a 30% reduction of pesticides applied;
- Showing that, through a combination of optimisation of spraying equipment and new treatment schedules, pesticide use can be reduced by at least 40%; and
- Establishment of an imaging system for detection of downy mildew disease, and an assessment of the feasibility of automatic early detection of fungal diseases.

Efficient and sustainable waste management methodologies using ICT tools enabling GHG emissions reduction

Project background

In 1995, European citizens generated on average 474 kg of municipal waste. This amount rose to 542 kg per person in 2010, and a further increase to 680 kg per person is expected by 2020. The current trend corresponds to an increase of almost 15% in less than 20 years. In spite of efforts made during the past few years to improve waste management, most of the waste generated (59% in EU-27 in 2010) is sent to landfills or incinerated. Several types of pollution, including greenhouse gas emissions (carbon dioxide and methane) and water pollution, result from landfills.

The net GHG emissions from the management of municipal waste are projected to decline by around 84 million tonnes of CO₂ equivalent by 2020 (compared with 1990 figures) in the EU plus Norway and Switzerland. Waste management, moreover, is costly, and in recent years many municipalities have assessed the cost effectiveness of their systems.

Project objectives

The EWAS project aims to foster innovation in waste management by demonstrating the potential of new information technologies to optimise current EU waste management practices and to establish a way forward for the adoption of a standard and more sustainable model. The project will study the current waste management systems of the regions involved to identify ways of making them more sustainable.

The project aims to highlight successful waste prevention and collection activities to promote their wider adoption across Europe. EWAS aims to ensure sustainable management of natural resources and waste, emphasising the importance of energy efficiency and the reduction of GHG emissions, noise and traffic congestion during the collection and transportation of waste.

The project actions will extend the uptake of innovative waste collection methodologies using low-invasive technologies that will modernise municipal waste management. These actions, which will be carried out in the municipalities of Seville (Spain) and Chania (Greece), will include:

- Creating an online citizens platform to raise awareness and foster recycling;
- Establishing standard waste management technologies for collecting garbage – i.e. sensors that control the filling levels, dynamic routes, etc.; and

LIFE13 ENV/ES/000725
LIFE EWAS



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

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Teresa ÁLAMOS

Duration of project:

27 months (01/07/2014 – 30/09/2016)

Total budget in euro:

1,174,963.00

EC contribution in euro:

581,731.00

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Information-Communication: Awareness raising – Information - Public and Stakeholders participation / Waste: Municipal waste (including household and commercial)

- Setting up an online global platform for stakeholders to improve the management of waste collection.

Expected results

- Reduction of the cost of waste management activities by 15-30% and GHG emissions by over 10%;
- Detailed analysis of existing waste collection methodologies and European legislative frameworks, and the new opportunities using ICT tools;
- Integrated ICT solutions to increase waste management efficiency;
- Innovative waste management methodologies based on advanced ICT tools that will reduce GHG emissions, noise pollution and costs;
- Impact report including environmental, economic, operational and awareness factors; and
- Exploitation report including a complete plan for applying the new waste management methodologies.

Transformation of disposed reverse osmosis membranes into recycled ultra-and nanofiltration membranes

Project background

In Spain, there is generally a low level of treatment of wastewater in conglomerations with populations of fewer than 2 000 inhabitants (treatment rate of less than 40-50%). According to EUROSTAT, about 35% of Europeans live in towns with a population of more than 100 000, while 40% live in small urban agglomerations. Many smaller municipalities lack facilities with effective systems for the treatment of wastewater, mainly due to lack of funding.

Project objectives

The project aims to increase the sustainability of membrane-based water treatment processes by improving their durability and reducing their environmental cost. The processed water obtained as a result of the treatment will contribute to EU efforts to usher in a 'recycling society', as outlined in the Waste Framework Directive (2008/98/CE). The improved treatment will also demonstrate an alternative to the disposal in landfills of exhausted reverse-osmosis filtration membranes used in wastewater treatment.

At national level in Spain, the project will comply with Royal Decree 1620/2007 on re-use of wastewater, while enabling the use of recycled membranes. Membranes from reverse osmosis desalination plants will be recycled and used in lower pressure filtration processes (ultra-nanofiltration).

The membrane recycling process is based on chemical treatment. The proposed methodology will include the development of three pilot plants: two membrane recycling plants (one with active treatment, and another for passive treatment); and a monitoring plant for checking membrane quality before and after wastewater treatment (capacity 1 000 m³ /day).

The recycled membranes will be tested in a pre-treatment process before the reverse-osmosis step in the Cuevas de Almanzora desalination plant, and in wastewater tertiary treatment in the Guadalajara wastewater treatment plant.

Expected results

- Transformation of old reverse-osmosis membranes for their re-use in low-pressure ultra-nanofiltration processes;
- Demonstration of the reverse-osmosis membrane

LIFE13 ENV/ES/000751
LIFE TRANSFOMEM



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Name of contact person

Eloy GARCÍA

Duration of project:

49 months (01/06/2014 – 30/06/2018)

Total budget in euro:

956,077.00

EC contribution in euro:

477,488.00

Themes: Waste: Waste recycling / Water: Waste water treatment

modification process, enabling membrane re-use in pilot-scale low-pressure (ultra-nanofiltration) filtration processes. Identification of the optimal operating conditions;

- Pilot and demonstration measures: one membrane monitoring pilot, two regeneration pilots and three demonstrators of re-use of the recycled membranes;
- An economic and financial feasibility study;
- Creation of a new database of every fluid treatment plant in Spain that uses reverse-osmosis membranes;
- A proposal for a new Best Available Technologies document for recycling of reverse-osmosis filtration membranes;
- Production of guidelines for recycling and re-use of old reverse-osmosis membranes; and
- Inclusion of information and knowledge gained about membrane recycling and re-use in academic programmes at Rey Juan Carlos and Alcalá universities.

Vineyards for carbon footprint reduction: a sustainable strategy to use biomass for heat & cold in wineries

Project background

The European wine sector faces many challenges. The field burning of agricultural residues produces methane (CH₄) and nitrous oxide (N₂O), both greenhouse gases. EU growers currently produce more than 25 million tonnes of woody remains from pruning every year. Most of this waste is left to decompose or burnt on-site.

Spain has the capacity to generate 533 MW from biomass from residues of agro-industries and mainly agricultural crop residues. In recent years the development of energy crops and initiatives for the collection, extraction and processing of biomass has increased. The potential biomass available in Spain is estimated to be at least 88 million tonnes of primary biomass, including existing forest biomass residues, agricultural residues, untapped existing mass and energy crops. Around 12 million tonnes of dry secondary biomass residues from agro-industries, such as vines shoots, can be added to this figure.

Project objectives

The project aims to demonstrate the feasibility of an integral governance strategy to mitigate climate change - the Vineyards Virtuous Circle (VVC).

Specifically, the project aims to:

- Define an overall strategy for the VVC that will mitigate climate change based on both environmental and socio-economic principles. It will involve all stakeholders of the biomass value chain - biomass suppliers from vineyards, collectors of biomass and consumers of energy - under the supervision of the Municipality of Vilafranca.
- Establish a Municipal Company of Services to manage the implementation of the low-carbon process, guaranteeing its socio-economic and environmental feasibility, decentralisation of energy sources and local empowerment both at energy and governance level.
- Set up a Biomass Value Chain (BVC) to generate renewable energies locally by using local resources in a cost-effective way. Actions will include collecting the biomass (from 3 000 ha of vineyard), drying it and distributing it to boilers installed in two wineries and four public facilities in La Girada.
- Develop policy recommendations and good practices on the use of vineyards' biomass that can be transferred to local, regional, national or European authorities.

LIFE13 ENV/ES/000776
LIFE VINEYARDS4HEAT (V4H)



Beneficiary:

Type of beneficiary

Local authority

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Name of contact person

Laura CARBÓ

Duration of project:

30 months (01/06/2014 – 30/11/2016)

Total budget in euro:

1,296,842.00

EC contribution in euro:

518,473.00

Themes: Climate change – Energy: Adaptation to climate change – Energy supply – Reduction of greenhouse gases emissions / Industry-Production: Agriculture – Fisheries – Food and Beverages / Information-Communication: Public and Stakeholders participation / Waste: Waste use

Expected results

- Agreed Biomass Roadmap 2025, which establishes a 10-year strategy to transition towards a low-carbon economy;
- Two wineries and four public facilities heated and cooled through biomass;
- Reduction of 2 958 tonnes of CO₂ emissions a year;
- 10 500 MWh/year of renewable energy produced and seven new jobs created (during the course of the project). Around 800 people directly benefiting from the heating supply system;
- €3.5 million of investments mobilised to sustainably operate the Biomass Decentralised Management System (including industrial distribution); and
- 600 vine growers and 25 wineries informed about the VVC through an awareness-raising campaign.

Demonstration of Anaerobic Membrane Bioreactor technology for valorisation of agro-food industry wastewater

Project background

Industrial wastewater is subject to environmental legislation. Limits have been set on discharges based on whether they are sent directly to a sewer system or pass through a river. While direct-to-sewer discharges are cheaper to treat, they nevertheless incur higher charges (Annex III of the Council Directive 91/271/EEC concerning waste water treatment). If industries adopt more efficient means of treating wastewater and eliminate/reduce the generation of waste or by-products (such as sludge), then water taxes and operating costs would decrease substantially along with the impact on the environment.

Project objectives

The main aim of the project is to further develop anaerobic membrane bioreactors (AnMBR), an emerging technology for the sustainable wastewater treatment of the agro-food sector. To achieve this aim, the project will construct an innovative and viable AnMBR wastewater treatment pilot plant that is specially adapted to the agro-food industry sector – i.e. it will offer an improved performance in treating wastewater with a high fat and oil content. This new technology also avoids problems linked to the treatment of wastewater with a high amount of organic matter, such as flotation of suspended biomass and the recollection of the biogas produced in digestion.

The project team expects that this technology will be transferrable to scenarios where conventional anaerobic bioreactors are an inefficient means of treating wastewater. These include cases of excess salinity, large fluctuations in the concentration and composition of wastewater, and wastewater with abnormally high concentrations of nitrogen, among others.

Expected results

- Construction of a pilot plant with a treatment capacity higher than one cubic metre a day that can be transported and operated in situ on a pre-industrial scale to demonstrate the efficiency and viability of a wastewater treatment system based on AnMBR technology;
- Elimination of chemical reagent in the pre-treatment of wastewater (current standard practice for treating wastewater from a snacks factory is to add 0.5-1 kg coagulant PCBA type, 0.01-0.05 kg floculant poliacrilamide type and 0.1- 0.2 kg NaOH per m³ of treated water);

LIFE13 ENV/ES/000779
LIFE+ WOGAnMBR



Beneficiary:

Type of beneficiary

University

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Jordi ROVIRA

Duration of project:

36 months (01/07/2014 – 30/06/2017)

Total budget in euro:

1,232,647.00

EC contribution in euro:

616,323.00

Themes: Climate change – Energy: Energy supply - Reduction of greenhouse gases emissions / Industry- Production: Food and Beverages / Waste: Waste use / Water: Waste water treatment

- Reduction of more than 90% of sludge produced in the physical-chemical pre-treatment of water depending on water characteristics;
- Use of 100% of the oil and grease from wastewater to produce biogas with a methane concentration of 60-70%; and
- Reduction in greenhouse gas emissions of 0.72 – 0.9 kg CO₂ per kg of organic matter treated.

Nutrients and regenerated water recycling in WWTPs through twin-layer microalgae culture for biofertilisers production

Project background

Human activities can have a significant negative impact on the environment, particularly by affecting the global biogeochemical cycles of carbon, nitrogen and phosphorus. Water supplies to urban areas and subsequent sanitation and wastewater systems – even when conventional treatment occurs – produce enormous punctual loadings (point source pollution) of nitrogen and phosphorus. Such water pollution leads to eutrophication, resulting in a loss of plant and animal species, along with negative impacts on water for human consumption and other purposes.

Furthermore, marine ecosystems are similarly affected by excess nutrients and thus the impact of eutrophication extends beyond inland waters to coastal and oceanic regions, too. Advanced wastewater treatment facilities are thus vital to remove these nutrients and meet the main objective of the Urban Waste Water Treatment Directive (91/271/EEC). This directive established minimum requirements for wastewater collection and treatment depending on the size of the agglomeration and the characteristics of the discharge area.

Project objectives

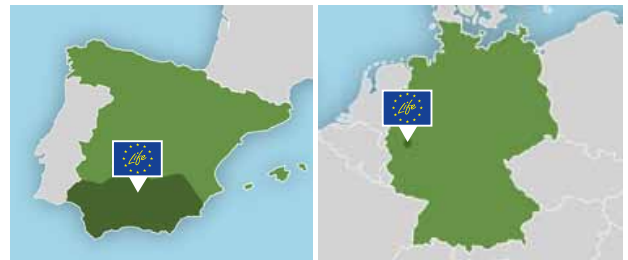
The LIFE+ TL-BIOFER project aims to address the environmental problem of wastewater produced by small- and medium-size urban agglomerations. The project plans to demonstrate a wastewater treatment plant using a Twin-Layer (TL) system: an advanced nutrient removal technology based on microalgae immobilised culture.

The project also plans to develop, produce and test bio-fertilisers derived from the remaining microalgae and the liquid effluent of the wastewater treatment system. The fertiliser will meet high agronomical standards of sustainable farming as well as the requirements of current and future EU regulations. The trials will be conducted in microplots for two different crops in northern Italy and four different crops in Spain.

Expected results

- Demonstration of the TWIN LAYER (TL) prototype for treatment of 12 m³/day wastewater from the secondary treatment along the two years of planned operation to produce a quality final effluent compliant with stringent requirements for discharge in sensitive zones (estuaries, reservoirs, protected areas etc.);
 - Total treated wastewater 7 300 m³ during the project;

LIFE13 ENV/ES/000800
LIFE+ TL-BIOFER



Beneficiary:

Type of beneficiary

Large enterprise

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Inmaculada GONZÁLEZ

Duration of project:

36 months (01/07/2014 – 30/06/2017)

Total budget in euro:

1,097,092.00

EC contribution in euro:

548,546.00

Themes: Environmental management: Eco-products design / Waste: Waste use / Water: Waste water treatment

- Uptake of 90-100% of nutrients (N and P) from wastewater (previous analysis shows total nitrogen content 38.33 mg/l, and total phosphorus content of 5.07 mg/l in wastewater):
 - 248 to 276 kg of N captured by microalgae during the project;
 - 32.9 to 36.5 kg of P captured by microalgae during the project;
- Development of a concept for transformation of harvested TL microalgae into a marketable biofertiliser product;
- Formulation and production of marketable biofertilisers from microalgae:
 - Total amount of biofertilisers produced during the project: 20 000 kg; and
- At least three new products formulated from three biofertiliser lines with at least one product at commercial stage for each:
 - 300 l for suspensions/foiar product;
 - 100 kg for powdered product;
 - 50 kg for micro-granulated product.

Citric Waste Integrated Management

Project background

Currently, there is no proper management of waste from the pruning of citrus trees. The most prevalent method remains the burning of the pruned material directly in the field. However, this poses environment risks and challenges associated with the emission of greenhouse gases, the impact on soil fertility, desertification, pollution of surface waters and the increased risk of fire spreading.

The project area is in the municipality of La Vall d'Uixo, a traditional citrus area with characteristics that are also common in many other citrus-growing areas of Europe, and even the world. Around 1 250 ha of citrus trees are cultivated in the municipality.

Project objectives

The LIFE ECOCITRIC project aims to demonstrate the technical, economic and environmental viability of a new system for exploiting agricultural waste from the pruning of citrus trees. It seeks to promote the sustainable management of agricultural waste and provide environmental and economic benefits for the citrus-fruit industry.

The process proposed by the project will divide the treatment of the pruning waste into two distinct stages: one for the leaves; and another for the wood. This will be demonstrated through the development and operation of a pilot treatment plant in the territory of La Vall d'Uixó.

The plant will treat the citrus-tree leaves through a series of chemical and physical processes - including distillation and hydrolysis - to obtain essential oils, fertiliser and animal feed. It will process the wood to produce pellets to be used as fuel and animal bedding. All these products will then be commercialised.

In addition, the project will carry out an assessment of the agricultural practices on local citrus fruit farms. This information will be used in the implementation of the project and also to help in developing better ways to manage the agricultural land in the municipality.

Expected results

- Development and operation of a pilot plant with a capacity to treat one tonne of pruning waste per day;
- Treatment of a total of 100 tonnes of pruning waste during the project, amounting to 2.1% of the total produced in the municipality;

LIFE13 ENV/ES/000889
LIFE ECOCITRIC



Beneficiary:

Type of beneficiary

Local authority

Name of beneficiary

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Jose Vicente ANDRÉS

Duration of project:

30 months (01/06/2014 – 30/11/2016)

Total budget in euro:

1,423,231.00

EC contribution in euro:

711,615.00

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Environmental management: Eco-products design / Industry-Production: Agriculture – Fisheries / Waste: Agricultural waste - Waste use

- Effective exploitation of pruning waste to produce high-value-added products for different markets - in particular: essential oils, fertilisers, animal feed and wood pellets;
- Demonstration that the process is environmentally friendly, economically feasible and easily transferable to other fruit-producing areas in the EU;
- A reduction in emissions of greenhouse gases, compared to incineration in the field;
- A more competitive citrus-fruit industry; and
- Data to support the potential development of stricter policies and laws for the sustainable management of agricultural waste.

Development of a cogeneration demonstration plant from biomass forest Bales

Project background

Greenhouse gas (GHG) emissions have been linked to changing climate patterns which pose considerable environmental challenges for EU Member States. The speed at which these changes are taking place is generating socio-economic impacts that are already detectable, and that are increasingly affecting disadvantaged areas.

Project objectives

The LIFE BIOBALE project aims to have a significant impact on GHG reductions by developing an innovative combustion system. This will allow for the first time the use of large granulometry (forest bales) biomass with no pre-treatment. The system will also include an organic Rankine cycle (a mathematical model that is used to predict the performance of steam engines) for the conversion to electricity, which will incorporate new components such as a new design of expander, based on compression equipment, and a wing condenser optimised specifically for this application.

This technology will aim to eliminate potentially dangerous and environmentally aggressive processes taking place in the biomass treatment, such as milling and splintering, which produce high powder emissions and noise generation, and have been the cause of serious and even mortal accidents among operators. The intermediate storage of milled biomass will also be avoided, hence reducing risk of fire by self-combustion.

Expected results

The project's main results include:

- A cogeneration demonstration plant for the combustion of forestry biomass bales with large granulometry, and for the electricity conversion through an Organic Rankine Cycle (ORC);
- The new technology will lead to a reduction in the plant operation costs of up to 50% with respect to other biomass cogeneration plants using conventional pellets. Savings will also be made from the use of a biomass (forestry waste) which can be as much as eight times cheaper than conventional sources;
- Generation of 670 000 kWh of electric energy and at least 1 000 MWh of thermal energy annually from sustainable and renewable energy sources such as forest biomass, to be used in public municipal installations; and
- Reduced GHG emissions of 690 tonnes CO₂/year, as well as SO₂ emissions of 1 267 kg/year and NO_x of 784 kg/year.

LIFE13 ENV/ES/000923
LIFE BIOBALE



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

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Duration of project:

36 months (01/06/14 – 31/05/17)

Total budget in euro:

1,767,893.00

EC contribution in euro:

872,444.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Energy supply - Reduction of greenhouse gases emissions / Habitats: Forests / Land-use and Planning: Forest management

Decreasing the environmental impact of waste management: An innovative leachate treatment using recovered membranes

Project background

Municipal solid waste (MSW) generation continues to grow both per capita and in overall terms. Although disposal of this waste in landfills has decreased in the last decade, it is still the most common option for waste management in most EU countries. Landfills cause a major negative impact on the environment, with one of the main problems being generation of leachate.

Leachate is highly polluted water generated by the decomposition of organic matter and rainwater percolating through the waste layers at a landfill site. Leachate usually contains large amounts of organic matter, ammonia, heavy metals, chlorinated organic compounds, inorganic salts and other pollutants. Landfill leachate is a heavily polluted liquid, the release of which into the environment must be avoided and is, in fact, forbidden by many regulations. Unless appropriately managed or treated, leachate will have harmful effects on the groundwater and surface water surrounding a landfill site, and will also pose a serious risk to public health.

Project objectives

The main objective of the LIFE RELEACH project is to demonstrate the technical and economic feasibility of new landfill leachate treatment strategies based on existing technologies, primarily membrane separation processes.

In particular, the project aims to:

- Evaluate the different policies and legislation on landfill leachate;
- Prepare a detailed characterisation of leachate from representative landfills at two demonstration sites (Manresa and Oris);
- Reproduce and optimise the different steps in the new process, and define the best operational conditions for treating a specific leachate;
- Design and build an innovative landfill leachate treatment based on the membrane process, including pre-treatment, desalination and concentrate treatment; and
- Conduct an environmental and economic assessment of the methodology.

Expected results

- A database with the composition of several leachates from different landfills in Catalonia and other European regions;

LIFE13 ENV/ES/000970
LIFE RELEACH



Beneficiary:

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Research institution

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Juanjo MARTÍ

Duration of project:

42 months (01/06/2014 – 30/11/2017)

Total budget in euro:

2,145,730.00

EC contribution in euro:

1,069,986.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Reduction of greenhouse gases emissions / Risk management: Pollutants reduction / Waste: End-of-pipe treatment – Landfilling / Water: Waste water treatment

- A versatile leachate treatment plant based on membrane processes to treat old landfill leachate;
- Treatment of at least 2 000 m³ of landfill leachate at the Manresa and Oris sites;
- Assessment of the different steps of the new process. The recoveries expected for each step are: ultrafiltration >95%; nanofiltration 90-95%; reverse osmosis 90-95% and electrodyalisis reversal 85-90%;
- Obtaining of a final effluent that can be discharged into water bodies without any risk;
- A reduction in the negative environmental impact of the landfill leachate treatment compared to the currently used technologies, by reducing the reagents used and energy consumption. Energy consumption of less than 25 KWh/m³ is expected compared to more than 50 KWh/m³ currently; and
- A reduction of more than 50% of the total operational costs of treating landfill leachate.

A Step towards zero eMissions goAI in Heath Sector: Best Practice Examples in Hospital Universitario Río Hortega

Project background

Hospitals contribute to climate change through their consumption of natural resources and waste generation. The UK National Health Service (NHS) estimates its carbon footprint at over 18 million tonnes CO₂/year, or 25% of the greenhouse gas emissions of the entire UK public sector. According to US Environmental Protection Agency (EPA) estimates, the 73 billion kWh consumed annually by the US health system have a cost of \$600 billion in the form of direct energy consumption and health externalities arising from pollutant emissions.

Project objectives

The LIFE SMART Hospital project aims to increase the resilience of hospitals to climate change by developing action plans dealing with energy, water and waste. The approach will be demonstrated at the Hospital Universitario Río Hortega (HURH), in Valladolid (Spain).

The project will undertake actions including:

- Energy measures:
 - Installation of high-efficiency incinerators;
 - Improvement of the performance of boilers;
 - Improved lighting system management;
 - Rationalisation of the ventilation system or installation of heat recovery systems in operating theatres;
 - Reduced greenhouse gas emissions through energy rationalisation measures;
- Water measures:
 - Water-saving measures such as the installation of flow-control devices or dialysis water re-use;
 - Improvements to the treatment of effluent generated by the hospital before discharge into public water systems;
 - Implementation of a system for water consumption control;
- Waste measures:
 - Improvements to the current design of waste classification, separation and collection systems;
 - Implementation of waste traceability measures; and
- Creation of a network of experts in sustainable management of hospitals.

Expected results

Improved sustainability of the demonstration hospital including:

- 10% reduction in the carbon footprint;
- 5% saving in the fuel used in incinerators and boilers;

LIFE13 ENV/ES/001019
LIFE SMART Hospital



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Raquel LÓPEZ

Duration of project:

39 months (01/09/2014 – 30/11/2017)

Total budget in euro:

1,794,999.00

EC contribution in euro:

756,838.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Energy supply - Reduction of greenhouse gases emissions / Environmental management: Integrated management - Life Cycle Assessment- Management / Information-Communication: Awareness raising: Information / Services and Trade: Healthcare - Social work / Waste: Waste reduction - Raw material saving / Water: Waste water treatment - Water saving

- 10% power saving from improvements to the lighting system;
- 30% reduction in energy consumption from better ventilation of operating theatres;
- 35% reduction in the hospital's water consumption;
- 20% reduction of pollutant load discharges from the hospital;
- 5% reduction in the amount of non-separated waste;
- 1% reduction in waste going to landfill; and
- Awareness raising in at least 20 hospitals / regional health organisations

Environmental impacts on bacterial ecology of bacteriophage use in aquaculture

Project background

Aquaculture often involves high population densities of fish, increasing the risk of rapid spread of infections and consequent economic losses. In order to reduce the incidence of bacterial infections, the use of prophylactic antibiotics has become generalised practice.

Much effort has been made to find environmentally friendly alternatives to antibiotics as prophylaxis agents in aquaculture. However, alternative prophylaxis is not possible in very small fish, among which the losses are greatest. Larvae and young fry cannot benefit from the modern technologies, and are still dependent on massive antibiotic treatments. Also, vaccines are useless for treatment of shellfish.

Bacteriophages (viruses that infect bacteria) are one promising alternative, combining high specificity, high efficiency and protection of the environment. Use of bacteriophages in industrial-level aquaculture has so far not been reported, and the environmental impacts have not been established. Evaluation of the environmental impact of bacteriophages, especially on environmental bacterial ecology, is necessary for their consideration as a veterinary treatment at industrial scale.

Project objectives

The project aims to demonstrate that use of bacteriophages in aquaculture has limited effects on environmental bacterial ecology.

The project will carry out the following actions:

- Bacteriophage selection: the bacteriophage groups will be selected according to their physical properties, target bacteria, fish species and others factors;
- Bacteriophage production at industrial scale: producing through infection of bacterial systems of about 30 litres of bacteriophage solution;
- Phagotherapy at industrial scale: the treatment will be applied at an aquaculture facility at Ria de Aveiro, an estuarine system on the north-western coast of Portugal. Through this action, the project will study phagotherapy treatment, only for environmental bacteria, in the early fish development stages (fry);
- Study of the effects of the treatment on animal models: zebra fish will be infected with fish pathogens and treated with bacteriophages; and
- Monitoring the effects of bacteriophages on commercial fish: different parameters will be analysed to

LIFE13 ENV/ES/001048
LIFE ENVIPHAGE



Beneficiary:

Type of beneficiary

NGO-Foundation

Name of beneficiary

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Igor HERNÁNDEZ

Duration of project:

36 months (01/07/2014 – 30/06/2017)

Total budget in euro:

820,622.00

EC contribution in euro:

410,310.00

Themes: Environmental management: Cleaner technologies / Industry-Production: Agriculture – Fisheries / Risk management: Pollutants reduction

estimate the effect of the treatment, including on fish survival and growth rate.

Expected results

- Demonstration of an alternative and more environmentally friendly solution to the use of antibiotics for bacteriosis treatment in fish, which will result in:
 - Variation of less than 10% of natural microflora in fish gut systems due to phage treatment;
 - Variation of less than 5% of natural microflora in environmental marine sediments; and
 - Reduction by 50% of dead fry during aquaculture processing due to bacterial pathogens.
- Simplified protocols to analyse the changes produced in the marine ecosystem from the introduction of antibacterial products;
- A 30% cost reduction due to a reduction in the number of dead fish; and
- Objective criteria to determine the consequences of use of bacteriophages in aquaculture at industrial scale.

New biofuel production technology to recover used frying oils and power the Seville's urban bus fleet

Project background

Various vegetable oils and animal fats are used in the production of biodiesel, which is seen as a more environmentally friendly alternative to mineral diesel. However, despite the advantages of these biofuels, there are still significant costs attached to their production. Growing crops for the production of oilseed and breeding animals for fats and oils both take up large areas of land and consume significant amounts of energy.

Project objectives

The LIFE BIOSEVILLE project aims to develop an integrated and sustainable system for the recovery and processing of used cooking oils to produce a new, more competitive and efficient biofuel. It aims to demonstrate the feasibility of using this biofuel in the local bus fleet in Seville to significantly reduce air pollution and greenhouse gas emissions.

The project will construct a pilot processing plant to produce biodiesel from used cooking oils. The first of two production modules will use an innovative technology to produce methyl esters. The second will use membrane technology to produce technical grade glycerine with a high degree of purity, which it will then process with acetic acid - through acid catalysis - to produce glycerine esters. The team will mix these methyl esters and glycerine esters to produce a more efficient biofuel. They will test at least 40 m³ of four different biofuel mixtures for use in the city bus fleet (TUSSAM) in Seville. Testing will take place in an engine bench and under real operating conditions, to measure both performance of the combustion process and emissions. Finally, the project will establish a programme to encourage the collection of used cooking oils by local citizens. TUSSAM will examine the possibility of providing discounted bus tickets to those supplying a certain amount of used domestic cooking oil.

Expected results

The project's main results include:

- Demonstration of the feasibility of recovery and management of used cooking oils to produce a new biofuel;
- Development of a prototype module for the production of biofuel from 55 m³ of used cooking oils, achieving the following purity targets:
 - Methyl esters of 99.5% purity from an innovative transesterification technology;

LIFE13 ENV/ES/001113
LIFE BIOSEVILLE



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

Fundación Centro Tecnológico Avanzado de Energías Renovables de Andalucía

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Guadalupe PINNA

Duration of project:

36 months (01/10/2014 – 29/09/2017)

Total budget in euro:

1,543,690.00

EC contribution in euro:

756,870.00

Themes: Air and Noise: Air pollutants / Climate change – Energy: Reduction of greenhouse gases emissions / Waste: Municipal waste (including household and commercial) - Waste reduction - Raw material saving - Waste use

- Technical grade glycerine of at least 95% purity, produced using membrane technology;
- Glycerine esters of 80% purity, produced through acid catalysis of the technical grade glycerine;
- Production of at least 4 000 litres of glycerine esters for use in biofuel mixtures;
- Production of at least 40 m³ of a new, high quality biofuel – meeting European standards (EN 14214); and
- Demonstration of the technical and economic viability of using the new biofuel in the local bus fleet in Seville.

Valorisation of pig carcasses through their transformation into biofuels and organic fertilisers

Project background

Over 145 million pigs were farmed in Europe in 2012, creating a large waste management challenge. In Spain alone, by-products from pork production are estimated at around 160 978 tonnes/year. Current processes to manage pig waste are inadequate and most of this waste is disposed of in landfills or incinerated

Project objectives

The LIFE+ VALPORG project aims to demonstrate a process for the sustainable management of animal by-products from the pork industry, especially pig carcasses and manure. It seeks to exploit these waste products by transforming them into biofuels - biogas and biodiesel - and organic fertilisers, with resultant environmental and socio-economic benefits.

The project will develop a prototype treatment process for pig carcasses to obtain high-quality meal and fat for subsequent use. The process will allow flexible operating conditions to optimise energy efficiency. It will meet all the health and safety requirements of current legislation for this type of waste.

The meat and bone meal (category 2) and glycerine obtained will be used as new substrates in biogas production in a co-digestion process with pig manure. To improve the efficiency of the anaerobic digestion and optimise the biogas production, the project will implement a new pre-treatment system of the animal by-product inputs, based on ultrasonic technology.

The project will also seek to use animal fats from category 2 to produce second generation biodiesel. It will develop a prototype plant for demonstrating an innovative and efficient process based on cavitation technology.

Finally, the project will produce an organic fertiliser from the digestate and acidic waste from the biodiesel production process. It will then demonstrate the agronomic potential of this fertiliser.

Expected results

- Treatment of one tonne/day of pig carcasses to produce high-quality meal and fat for the production of biofuels;
- Use of ultrasonic technologies as a pre-treatment process, providing efficiencies of volatile solids removal of at least 80% from animal by-product substrates

LIFE13 ENV/ES/001115
LIFE+ VALPORC



Beneficiary:

Type of beneficiary

Professional organisation

Name of beneficiary

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Name of contact person

Pedro ÁNGEL SANZ

Duration of project:

36 months (01/09/2014 – 30/08/2017)

Total budget in euro:

1,986,312.00

EC contribution in euro:

992,456.00

Themes: Climate change – Energy: Energy supply - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies - Eco-products design / Industry-Production: Food and Beverages / Waste: Industrial waste - Waste use

for biogas production;

- Transformation of 80% of the organic matter content of meat and bone meal – category 2 - into biogas (65% methane);
- Transformation of 80% of the organic matter content of pig manure into biogas (65% methane);
- Transformation of 90% of the animal fats – category 2 - into biodiesel through a prototype process – up to 100 litres/hour - using cavitation technology;
- Use of the remaining 20% of the organic matter content of the meat and bone meal as organic fertiliser with demonstrated agronomic potential; and
- A 100% reduction of contaminant emissions related to the current management of pig carcasses by incineration - CO₂, NO_x, dioxins, furans, etc.

Functional textiles and leathers by innovative MLSE process

Project background

The textile and leather sectors are water intensive. According to the Best Available Techniques reference document (BREF) for the textile industry, in mills finishing cotton woven fabrics, waste water flows can range from 50 to 200 l/kg, depending on the efficiency of the equipment at the textile facility. The main environmental concern is the amount of water discharged and the chemical load it carries. Other important issues are energy consumption, emissions to air, and solid waste and odours, which can be a significant nuisance.

In the framework of the IPPC Directive (2008/1/EC), the BREF documents for the textile and tanning sectors strongly recommend reductions in water consumption and of waste water discharges and the identification of alternatives to harmful chemicals, especially halogenated organic compounds used in fire-retardant and water-proofing treatments.

Moreover, finishing treatments to provide textiles and leathers with special characteristics such as water-proofing, or antibacterial or fire-retardant properties, are, in general, wet batch processes that involve high consumption of energy and large volumes of water. Furthermore, these treatments usually involve the use of hazardous halogenated organic compounds, biocides and organo-phosphorous compounds.

Project objectives

The TEXTILEATHER project will adapt and implement Multiple Laser Surface Enhancement (MLSE) technology for the treatment of textiles and leathers. This technology was originally developed for the metallurgic and electronic sectors. It consists of a dry, continuous process that can reduce significantly the environmental impact of textile and leather finishing operations, reducing greenhouse gas emissions and waste, and use of chemicals, water and energy.

The project will demonstrate, on a semi-industrial scale, the technical, environmental and financial feasibility of the MSLE technology for the treatment of textiles and leather.

The project will apply MLSE to different textiles produced by Spanish and Italian textile and leather manufacturers, in order to determine the materials and conditions for and in which the technology works best. The results of the tests will be used to adapt MLSE equipment currently available in the UK for reel-to-reel material processing.

LIFE13 ENV/ES/001138
LIFE TEXTILEATHER



Beneficiary:

Type of beneficiary

Professional organisation

Name of beneficiary

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Name of contact person

Felipe CARRASCO

Duration of project:

30 months (02/06/2014 – 30/11/2016)

Total budget in euro:

942,842.00

EC contribution in euro:

471,419.00

Themes: Climate change - Energy-Energy efficiency - Energy saving - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies / Industry-Production: Leather and Footwear - Textiles – Clothing / Risk management: Pollutants reduction / Water: Water saving

Expected results

- A reduction of 2% in total water consumption in the textile and leather facilities and of about 75% in the finishing process;
- A reduction of 10-15% in total power consumption and of more than 90% in the finishing process;
- A reduction of about 10% in consumption of chemicals in the total production process and of more than 90% in the finishing process;
- As a consequence, a reduction in the environmental costs of the textile and tanning industries is foreseen; and
- Valuable textiles and leathers will be obtained, which will provide the sector in Europe with new niche opportunities.

Demonstration of a low cost and environmentally friendly Zinc Air Energy Storage System for renewable energy integration

Project background

A complete transformation of all sectors of the economy is required to mitigate climate change and to limit global warming to the internationally agreed target of 2°C above pre-industrial levels by 2050.

According to the European Environment Agency, the energy sector is the largest single source of CO₂ emissions, generating 31% of all EU CO₂ emissions. The transition to a low-carbon economy necessarily involves a significant transformation of the energy sector, in particular the electricity system. As part of this transformation, there will be increased generation of electricity from renewable sources, which can be intermittent. The intermittent nature of major renewable technologies such as wind and solar energy is a barrier that jeopardises the achievement of Europe's objectives of renewable penetration in the medium and long term.

One of the main challenges for renewable energy in Europe is not generation but grid integration and adaptability to fluctuating power demand. Different technical solutions such as smart grids, international grid connections and energy storage facilities play an essential role in enabling the development of a low-carbon electricity system. Energy storage systems in particular could play a key role because they could transform variable and intermittent renewable energy sources into flexible and reliable sources.

Project objectives

LIFE ZAESS will demonstrate an innovative zinc-air energy storage technology that can address the needs of intermittent renewable energy. This innovative zinc-air flow battery combines the advantages of metal-air batteries and flow batteries. It offers: increased rechargability and life span; less energy lost in the storage process; increased total system capacity, making it suitable for grid-scale renewable energy storage; and reduced production costs, because expensive ion-exchange membranes are unnecessary.

In particular, the project aims to:

- Build and test a demonstration energy storage pilot plant based on novel rechargeable zinc-air battery technology, and assess its scalability;
- Assess the environmental impact associated with the construction and operation of this type of energy storage facility; and
- Propose a legal and regulatory framework for the deployment of large-scale energy storage facilities in

LIFE13 ENV/ES/001159
LIFE ZAESS



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Ángel GALINDO CARBAJO

Duration of project:

40 months (02/06/2014 – 01/10/2017)

Total budget in euro:

1,207,151.00

EC contribution in euro:

603,575.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Energy supply - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies

order to overcome those barriers for future renewable energy market penetration.

Expected results

- Demonstration of the scalability of the technology from laboratory scale to the range of 1-4 kilowatt hours;
- The pilot plant round-trip energy efficiency is expected to be 60-70%; it is planned to operate the plant for between 1 000 and 2 000 cycles;
- A conceptual engineering study for a MW (megawatt) scale plant yielding capital costs between 2 000 and 3 000 €/kilowatt. This is a commonly accepted cost target for grid-scale energy storage systems in the short to medium term; and
- A full environmental impact assessment covering the entire lifecycle of MW-scale energy storage plants based on zinc-air technology, including detailed environmental and carbon footprint analyses.

From Whatever Residue into Levulinic Acid – an innovative way to turn waste into resource

Project background

Rice growers commonly deal with rice-straw waste by burning it, emitting carbon dioxide into the atmosphere. The production of rice in the EU in 2012 amounted to 3.05 million tonnes. The amount of straw generated is 0.8 tonnes per tonne of rice produced. Thus, 3.05 million tonnes of rice equates to 2.4 million tonnes of this waste, resulting in 4.1 million tonnes of CO₂ emitted during the burning process.

Alternatives to rice-straw burning have been researched but none has so far resulted in a low-cost, sustainable, practical solution. Any alternative use of the rice straw must be economically viable for rice growers.

Project objectives

The LIFE WALEVA project will demonstrate how the environmental damage from the burning of rice-straw can be eliminated, and the waste can be deployed as raw material with added value by the introduction of a new value chain which ends in the production of LEVA (levulinic acid), a chemical monomer that is in demand because of its uses in a multitude of industrial sectors, including pharmaceuticals, biofuels, general chemistry, polymers and food.

The chemical process, developed in the laboratory by the beneficiary in 2012, will be demonstrated in a pre-industrial plant which will treat 0.5 tonnes/month of rice straw and produce 75-100 kg/month of LEVA. This technology will also be able to utilise other waste streams generated during the process: a stream rich in xylose (XYL) and a solid (bio-charcoal) that will be used to provide energy to the process, making it more energy efficient.

Expected results

- Treatment of at least 45% of the total Spanish rice-straw residue in the first three years (405 000 tonnes/year of waste). It is estimated that 65-70% (630 000 tonnes/year of waste) of rice-straw residue can be treated using LIFE+ WALEVA's technology nationwide. The amount of rice straw treated with the new technology will be around 40% of the total (1.2 million tonnes/year) over the next five years;
- Reduction in CO₂ emissions by 688 000 tonnes/year during the first three years and 1.07 megatonnes/year during the subsequent five years. At European level, CO₂ emissions can be reduced by about 2.04 megatonnes/year;

LIFE13 ENV/ES/001165
LIFE WALEVA



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Vicente LÓPEZ FERNÁNDEZ

Duration of project:

34 months (02/06/2014 – 31/03/2017)

Total budget in euro:

1,633,680.00

EC contribution in euro:

816,839.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Energy supply - Reduction of greenhouse gases emissions / Industry-Production: Agriculture – Fisheries – Chemicals / Waste: Agricultural waste - Waste use

- Production of LEVA in high yield (18-22%) and high purity (95-98%). Production volumes are expected to be 40 500 tonnes/year in the first three years after the end of the project, increasing to 63 000 tonnes/year in the subsequent five years. At European level, LEVA production could reach 156 000 tonnes/year within five years after the project's end; and
- Bio-charcoal production would be about 200 kg/month. It could have a heating value of around 25.6 megajoules/kg (with 15% ash). Different industrial monomers, such as formic acid, will also be produced by the process.

Adaptation and mitigation measures to climate change in the Ebro Delta

Project background

The Ebro Delta in Catalonia, a wetland of international importance, is considered one of the coastal systems most vulnerable to climate change in the EU. The delta is undergoing a loss of wetlands and rice paddies because of coastal regression, caused by diminishing fluvial sediments, which are retained in the reservoirs of the basin. The coast is retreating by more than 10 metres per year in the mouth of the delta, where 150 hectares of wetland were lost between 1957 and 2000. The problem is accentuated by the decline in the elevation of the delta, because of the rise in sea level and subsidence. About half of the delta (15 000 ha) could be affected by this phenomenon during the 21st century.

Project objectives

The LIFE EBRO-ADMICLIM project will implement a number of climate change adaptation and mitigation pilot actions in the Ebro Delta. It will implement an integrated approach to the management of water, sediment and habitats (rice fields and wetlands), with the aims of optimising ground elevation (through inputs of inorganic sediment and organic matter), reducing coastal erosion, increasing the accumulation (sequestration) of carbon in the soil, reducing greenhouse gas (GHG) emissions and improving water quality.

Specifically, the project aims to:

- Produce a climate action plan for the Ebro Delta;
- Take climate adaptation measures in the delta. The aim is to restore the sediment flow by increasing sediment deposits in the delta; and
- Carry out climate adaptation and mitigation measures for the rice fields and wetlands in order to:
 - Optimise carbon and nutrient sequestration;
 - Minimise greenhouse gas emissions from them; and
 - Increase the ground elevation.

As a result of these initiatives, guidelines will be established for a programme of adaptation and mitigation measures with emphasis on the rice sector. It will be essential to design a strategy for voluntary reduction of GHG that has the rice sector's support.

Expected results

- Demonstration of the feasibility of reincorporating about 1 000 tonnes/year of Ebro River sediments currently retained in a water treatment plant;
- Determination of the real capacity of the Ebro River

LIFE13 ENV/ES/001182
LIFE EBRO-ADMICLIM



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Josep Carles IBAÑEZ MARTÍ

Duration of project:

48 months (02/06/2014 – 01/06/2018)

Total budget in euro:

2,260,960.00

EC contribution in euro:

1,124,341.00

Themes: Climate change – Energy: Adaptation to climate change - Reduction of greenhouse gases emissions / Habitats: Coastal / Land-use and Planning: Sensitive and protected areas management - Soil and landscape protection / Water: River basin management

to transport sediment, which is expected to change from 10 mg/l at present to about 100 mg/l if the flow of sediment through reservoirs is restored;

- Optimisation of the performance of constructed wetlands;
- Assessment of GHG emissions from delta rice fields, which are expected to be in the order of 80 000 tonnes/year of CO₂ equivalent. Reductions of 10-15% are expected to be achieved from changes in agricultural practices; and
- Assessment of Ebro Delta subsidence, which has been estimated at about 2-3 mm/year, and identification of the areas most vulnerable to rising relative sea levels.

Sustainability of photocatalytic technologies in urban pavements: from laboratory tests to in field compliance criteria

Project background

The negative impact on human health from air pollution can range from acute health effects and minor eye irritation, to severe chronic health issues including upper respiratory symptoms, chronic respiratory diseases, asthma, cardiovascular diseases and lung cancer. At global level, air pollution is estimated to be responsible for approximately 800 000 premature deaths each year.

The EU air quality directives aim to reduce air pollution associated with particulate matter, volatile organic compounds, nitrogen oxide and ozone. One proposed solution is photocatalytic technology, which can be used for air purification. Some attempts have been made to apply photocatalytic technology in urban agglomerations. However, it has been very difficult to evaluate the effectiveness of the technique.

Project objectives

LIFE-PHOTOSCALING's objective is to demonstrate the validity of photocatalytic technology in urban agglomerations by establishing instruments enabling scaling-up from laboratory measurements to application in cities, by developing a decision-support tool and by assessing the sustainability of different solutions in different environments to encourage the widespread use of this technology.

LIFE-PHOTOSCALING intends to bridge the gap between research, policy and widespread implementation of the technology. Specific project activities will include:

- Development of two demonstration platforms at an intermediate pilot-plant technical scale;
- Technical development of a prototype for in-situ measurement of photocatalytic efficiency;
- Development of performance indicators for process evaluation;
- Modelling of the photocatalytic processes;
- Development of a decision-support tool, enabling sustainability assessment using lifecycle assessment of the proposed solutions; and
- Validation of the tool in real conditions in the city of Madrid.

The results will be submitted as draft proposals to the European Committee for Standardisation (CEN) (Technical Committee 386 "Photocatalysis"), and to other national standardisation groups.

LIFE13 ENV/ES/001221
LIFE-PHOTOSCALING



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Name of contact person

Marta CASTELLOTE

Duration of project:

57 months (01/10/2014 – 30/06/2019)

Total budget in euro:

1,761,341.00

EC contribution in euro:

863,170.00

Themes: Air and Noise: Air pollutants / Environmental management: Cleaner technologies - Life Cycle Assessment-Management / Land-use and Planning: Urban design / Risk management: Pollutants reduction

Expected results

- Two photocatalytic platforms made of the same representative materials in two different locations, for long-term evaluation, even beyond the end of the project;
- Development of a technique enabling measurement of the efficiency of photocatalytic materials;
- Detailed protocols explaining the procedure for measuring the operational performance of the photocatalytic materials, including effects of the contaminants, environmental conditions, efficiency and other parameters;
- Indicators for the evaluation of the materials and the methodology to apply them to assess the performance of the products; and
- A decision-support tool to assess the sustainability of each particular solution in different conditions (such as type of street, dominant wind or traffic load).

Development and global enforcement of GHG capture photobioreactors in agroindustrial activities

Project background

The EU is moving towards a low-carbon economy as part of its strategy to tackle challenges caused by changing climate patterns. Improvements in, and expansion of, sustainable agricultural practices can contribute to this strategy. According to the Commission's Communication, 'A Roadmap for moving to a competitive low carbon economy in 2050', by 2050 the agriculture sector can reduce non-CO₂ emissions by 42-49% compared to 1990.

The sector has already achieved a significant reduction. More reductions are feasible in the next two decades. Agricultural policies should focus on options such as further sustainable efficiency gains, efficient fertiliser use, bio-gasification of organic manure, improved manure management, better fodder, local diversification and commercialisation of production and improved livestock productivity, as well as maximising the benefits of extensive farming.

Project objectives

The main objective of the project is to demonstrate the climate-mitigation efficiency of agro-industry activities based on GHG capture by cultivated native algae. A soil bio-improver will then be produced.

To meet this objective, the project will develop a cultivation system of autochthonous algae harnessing waste from different agro-industries: wineries, cheese producers and cattle. The selection of the algae and cyanobacteria species will be carried out according to their GHG storage capacity, among other considerations.

Once the algae species are chosen, they will be cultivated in two newly developed mobile cultivation plants (photobioreactors), which will be fed with liquid waste from two wineries and a cheese producer. The final result will be algae biomass which will be applied in powder form as soil bio-improver in agricultural, forestry land as well as in areas in process of soil remediation.

In short, the project aims to capture GHGs, re-use waste from two agro-industries and reduce the use of mineral and synthetic fertilisers in agriculture, forestry and soil remediation.

LIFE13 ENV/ES/001251
LIFE+ IntegralCarbon



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Name of contact person

Jordi ROVIRA

Duration of project:

30 months (01/07/2014 – 31/12/2016)

Total budget in euro:

1,253,361.00

EC contribution in euro:

602,636.00

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Industry-Production: Agriculture – Fisheries / Waste: Agricultural waste - Industrial waste - Waste use

Expected results

- Construction of versatile and mobile prototypes for cultivation of 30m³ of algae for use in waste pre-treatment processes;
- Capture of the equivalent of 187 tonnes of carbon a year;
- Reduction by 40-65% per ha of the carbon footprint in agriculture through partial substitution of mineral nitrogen fertilisation;
- Demonstration of the real economic cost of including these prototypes within an integrated management of waste and GHG emissions;
- Demonstration of the versatility of these prototypes in agro-based industries that emit GHGs and generate waste; and
- Demonstration of the socio-economic benefits from the new technology, particularly in terms of improving business competitiveness in the agro-industry.

CO₂ Emission Reduction of the Rice Cultivation Through Energy Valorisation of the Rice Straw

Project background

One of the main environmental challenges of rice cultivation is the management of the organic waste material known as 'rice straw'. In Spain, two important rice cultivation areas, which are close to areas of high environmental value, are: 'Las Marismas del Guadalquivir' in the Doñana Natural Park in Andalusia; and 'L'Albufera' in the L'Albufera Natural Park in Valencia. Together, they account for more than 50% of the country's rice production.

Project objectives

SOSTRICE is a demonstration project that aims to reduce energy, fertiliser and water consumption in rice cultivation by means of a sustainable rice straw management system. The model will involve the treatment of rice straw and its obtained by-products using controlled anaerobic digestion and combustion technologies.

The application and demonstration of the SOSTRICE model will be carried out in two of the most important rice cultivation areas of Spain, which are situated within two protected areas: Doñana and L'Albufera Natural Parks, in Andalucía and Valencia respectively.

The project expects to recover energy in the form of: electrical energy from the controlled incineration of rice straw, and biofuels from controlled anaerobic digestion. The remaining by-product from these controlled treatment processes will be used as an organic fertiliser.

Both the recovered energy and the fertiliser will be re-used within the rice cultivation industry to replace the consumption of non-renewable fossil fuels and inorganic fertilisers. By using the waste and avoiding the consumption of raw materials, it will have a double benefit, reducing the life-cycle costs of the industry and improving its environmental sustainability.

Finally, the project also expects to reduce water consumption. By avoiding fermentation of the rice straw in the fields, the project will reduce the need to use water to condition and irrigate the fields before and during rice cultivation.

Expected results

The project's main expected results include:

- Exploitation of rice straw through controlled processes of incineration and anaerobic digestion, producing:

LIFE13 ENV/ES/001333
LIFE SOSTRICE



Beneficiary:
Type of beneficiary
Public enterprise

Name of beneficiary
Instituto Andaluz de Tecnología

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Name of contact person
Olga AGUILERA

Duration of project:
36 months (02/06/2014 – 31/05/2017)

Total budget in euro:
1,583,235.00

EC contribution in euro:
791,615.00

Themes: Climate change – Energy: Energy supply - Reduction of greenhouse gases emissions / Industry-Production: Agriculture – Fisheries / Waste: Agricultural waste - Waste use

- electrical energy (1 800 kWh/t rice straw);
- bio-fuels (1 540 kWh/t rice straw);
- bio-fertilisers (2.52 kg N/t rice straw, which is 42% of the total nitrogen needed for rice cultivation);
- Avoidance of environmental costs of uncontrolled incineration and fermentation in the field;
- Replacement of fossil fuel energy consumption in agricultural machinery and irrigation equipment with electric energy and bio-fuels produced from rice straw;
- Reduction in the use of inorganic fertilisers in rice cultivation, replacing them with bio-fertiliser created from the anaerobic digestate from the rice straw; and
- Reduction in the total water consumption of rice cultivation by 10-15%, which implies an overall annual decrease of 55.6 hm³ in the areas of Doñana and L'Albufera.

Membrane for ENERGY and WATER RECOVERY

Project background

In Europe most municipal wastewater treatment plants (WWTPs) currently use aerobic processes that consume a considerable amount of energy. Bioreactor aeration can use as much as 60% of total WWTP energy consumption.

Costs related to such wastewater treatment are expected to rise due to increasing restrictions on the discharge of treated water (EU Water Framework Directive) and sludge disposal. Such restrictions represent a significant challenge for treating wastewater. Furthermore, new regulations related to the mitigation of greenhouse gas emissions could penalise both energy consumption and sludge production.

Project objectives

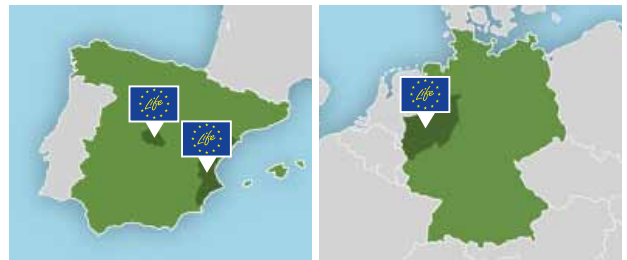
The LIFE MEMORY project aims to demonstrate (at an industrial prototype scale) an anaerobic technology, using the innovative Submerged Anaerobic Membrane Bioreactor (SAnMBR) technology, as an alternative to traditional urban wastewater treatment.

The technology combines anaerobic digestion and membrane technology, allowing for the treatment of urban wastewater at ambient temperatures. Anaerobic digestion allows the conversion of the organic matter into a biogas flow (composed mainly by CH₄ and CO₂) that can be used at the WWTP to generate heat energy and electric power. Meanwhile, membrane filtration allows the sludge retention time (SRT) to be increased by 100% without increasing the reactor volume – thus in turn permitting anaerobic processes to be used for low-loaded wastewaters. Low growth rate of anaerobic bacteria coupled to longer sludge retention time reduces sludge production, so that there is less residual waste to be disposed of and fewer emissions.

This new approach focuses on a more sustainable concept, where wastewater converts into a source of energy and nutrients, and also a recyclable water resource by membrane disinfection.

The project will demonstrate the economic feasibility of using SAnMBR technology for treating urban wastewater in a pilot plant consisting of an anaerobic reactor with a total volume of seven cubic metres connected to two membrane tanks, each one with a total volume of one cubic metre.

LIFE13 ENV/ES/001353
LIFE MEMORY



Beneficiary:

Type of beneficiary

Public enterprise

Name of beneficiary

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Frank ROGALLA

Duration of project:

48 months (01/07/2014 – 30/06/2018)

Total budget in euro:

2,102,327.00

EC contribution in euro:

1,046,101.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Energy supply - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies / Water: Waste water treatment

Expected results

- Reduction of the energy consumption per m³ of treated water by 70%: Compared to typical consumption ratios in WWTPs based on CAS process (0.25-0.6 kWh/m³) and aerobic MBR systems (0.50-2.5 kWh/m³), the proposed technology offers a significant reduction in electricity consumption and the related carbon footprint;
- Reduction of CO₂ emissions from the oxidation of organic matter by 80%, passing from (in CO₂ equivalents) 2.4 kg CO₂/kg COD eliminated to 1.4 kg CO₂/kg COD eliminated;
- Reduction by 50% of sludge production (kg TSS/kg COD removed) compared to aerobic processes;
- Reduction by 25% of the space requirement for the treatment facilities compared to the conventional, 'aerobic' WWTPs; and
- Establishment of a protocol for the design and operation of WWTPs based on this new technology.

LIFE Fresh Box: a sustainable transport solution conserving quality of fresh produce, reducing waste & fuel consumption

Project background

Fresh products, such as fruits and vegetables, are highly perishable. They therefore require rapid transportation and good storage after being harvested in order to maintain their physical, chemical and organoleptic properties.

Enhancing the shelf life of fresh produce, can help avoid food waste during transportation/distribution and in households. Food waste in the EU is considered to amount to 89 million tonnes/year and 42% of it is generated in households. Associated GHG emissions have been estimated to equal 1.9 tonnes of CO₂ equivalent/tonne of food waste.

Project objectives

The LIFE Fresh Box project aims to improve the sustainability of the distribution of fresh products to reduce waste in the perishable-food sector. This will also improve the sector's ability to offer better products to the end consumer and improve the sector's overall competitiveness.

Such aims will be achieved by developing and demonstrating an innovative and more environmentally friendly container called the Fresh Box. This container will improve the sustainability of the full value chain of fresh product distribution (from farm to consumer). The Fresh Box container will reduce food waste, extend fresh product shelf life and reduce fuel/energy consumption.

The Fresh Box is an active/smart container that stores/ transports each type of fresh product in the ideal conditions for the required respiration rate. Its innovative micro/macro perforated membrane system includes active substances and ethylene absorbers that protect fresh products from microbial spoilage, thereby extending shelf life and avoiding food waste.

Fresh Boxes are monitored with an innovative Integrated Sensor Kit (using RFID technology) to check the main environmental features in the container and allow traceability. They are lightweight, made with a technology which saves energy (MuCell SFC) and apply an innovative material, PLA, which is recyclable, biodegradable and compostable.

Furthermore, the Fresh Box can be used to transport fresh products that are harvested at a higher maturity stage. As a consequence, end consumers will be able to

LIFE13 ENV/ES/001362
LIFE Fresh Box



Beneficiary:
Type of beneficiary
Research institution

Name of beneficiary
Fundación Parque Científico Tecnológico Aula Dei

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Name of contact person
Sara REMÓN

Duration of project:
36 months (01/07/2014 – 30/06/2017)

Total budget in euro:
1,851,396.00

EC contribution in euro:
921,696.00

Themes: Environmental management: Cleaner technologies – Eco-products design / Industry-Production: Agriculture – Fisheries – Food and Beverages / Services and Trade: Transportation – Storage / Waste: Agricultural waste – Waste reduction – Raw material saving

enjoy fruits and vegetables with better physical, chemical and organoleptic (e.g. taste, smell, feel) features.

Expected results

- Increased shelf life of fresh products, by 30% compared with fresh products transported in conventional containers;
- Reduced food waste, by 20% compared to fresh products transported in conventional containers;
- Better physical, chemical and organoleptic features of fresh food compared with products transported in conventional containers; and
- Reduced energy consumption, by at least 20%, less material used during manufacturing compared with conventional containers and overall reductions in GHG emissions.

LIFE Coop 2020: pilot for rural smart grids through optimisation of energy use and innovative renewable biomass sources

Project background

Over the past decade European agricultural co-operatives have come under increasing financial pressure due to the fall in prices for their products and rising energy costs. Diversification is necessary for survival. Agricultural co-operatives play an important role in 'binding' together farmers in order to ensure that they have access to markets, purchasing power, knowledge, etc.

If these co-operatives were to disappear this would have a devastating effect on the rural economies of Europe, in particular Spain, where 20.6 million ha (40% of the total surface) is used for agriculture. However, currently, unused natural resources (olive and fruit pits, wood, agricultural and pruning waste) are perceived more as a problem than as a potential source of renewable and sustainable income.

Project objectives

This main aim of LIFE Coop 2020 is to demonstrate a new sustainable business model for agricultural co-operatives. This model will be based on the creation of rural smart grids benefiting from energy efficiency and renewable energy generation measures. Agricultural co-operatives will become more competitive as a result of lower energy consumption and the on-site generation of green energy. The project actions will be carried out in the facilities of the Cambrils co-operative and on a network of participating farms.

Resource efficiency gains will be achieved by developing, testing and installing five hybrid wind-power devices. These will be applied to irrigation systems to improve their energy efficiency. Energy crops – such as cardoon/Spanish artichoke thistle, giant cane, Siberian elm, triticale, eucalyptus viminalis, and opuntia ficusindica – will be tested to assess their viability using low-input production systems in arid conditions. Findings will be compared against other commercial crops and disseminated throughout the farming community.

A new bioenergy heat and power plant will be installed to re-use the waste biomass that is generated by the co-operative's facilities. Further energy savings will be generated by a micro 'smart grid' that automatically controls energy demand/usage through load shedding and by adding capacity with on-site generation.

The project will demonstrate the viability of a new

LIFE13 ENV/ES/001513
LIFE Coop 2020



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Jaume BAIGES FOLCH

Duration of project:

48 months (01/07/2014 – 30/06/2018)

Total budget in euro:

2,497,960.00

EC contribution in euro:

1,228,480.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Energy supply - Reduction of greenhouse gases emissions / Industry-Production: Agriculture – Fisheries / Waste: Agricultural waste - Waste use

productive model that is expected to generate 'green jobs' and make useful contributions to sustainable rural development. It aims to lead to the implementation and expansion of rural smart grids in other European agricultural regions.

Expected results

- Demonstration of the economic viability of a new co-operative model which implements renewable energies as an important additional source of income for its operations;
- Savings of at least 20% on the co-operative's electricity bill;
- Savings of at least 50% on the participating farmers' electricity bill for irrigation; and
- Demonstration of a 10% lower carbon footprint of the co-operative thanks to the combined actions of the project.

Small scale Combined Heat and Power based on biomass in the region of southeast Sweden

Project background

Combined Heat and Power (CHP) technologies based on biomass combustion have great potential to reduce CO₂ emissions because they use renewable energy sources, such as wood fuels or sawdust. Typical fields of application for biomass CHP plants include: wood processing industries, sawmills, district heating systems and industries with a high process heat and cooling demand. In order for CHP plants to operate in a way that is economically and ecologically beneficial, both the electricity and the heat produced must be used.

CHP technology is already available on Swedish and European markets. Due to the high installation costs, and a lack of information about its efficiency, the technology is, however, currently not widely used in small-scale plants. Extensive research has been undertaken to illustrate the vast environmental potential of CHP technology but a larger initiative that looks at increasing market application is still needed.

Project objectives

This project will demonstrate six different types of small-scale biomass CHP technology. The tests will take place in companies that use different technologies and at different scales. The aim is to pave the way for a broader application of biomass CHP technology. The knowledge gained will be disseminated on a regional, national and European level.

The main project objectives are to:

- Demonstrate the technologies at three small-scale biomass-based CHP plants that will be built in Sweden;
- Promote the use of, and a business model for, small-scale biomass-based CHP technology at the regional, national and Europe level; and
- Increase the production of renewable electricity by promoting local small-scale biomass-based electricity production.

Expected results

- Greater knowledge about the environmental performance of biomass-based CHP technology;
- Increased use of biomass as a renewable fuel;
- The production of seven GWh/year of renewable electricity; and
- A decrease in CO₂ emissions of 7 000 tonnes/year by using biomass-based CHP technologies.

LIFE13 ENV/SE/001113
LIFE+ small scale CHP



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

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Duration of project:

54 months (01/07/2014 – 31/12/2018)

Total budget in euro:

3,933,351.00

EC contribution in euro:

1,406,675.00

Themes: Climate change – Energy: Energy supply - Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies

LIFE+ISR-Innovative sludge reduction

Project background

EU wastewater treatment plants (WWTPs) produce 30 000 tonnes (dry matter) of sludge daily. This sludge is deposited, incinerated or used as fertiliser. Sludge disposal has large negative environmental impacts and is costly. The main challenge for the sustainable operation of WWTPs is to decrease these negative environmental impacts and the costs of sludge handling. Digestion has been introduced to reduce the amount of waste production, and at the same time produce energy, resulting in a lower environmental and carbon footprint.

State-of-the-art technologies are only economically viable for larger WWTPs, limiting actual implementation. For example, in the Netherlands, the present digestion technology is only economically viable for WWTPs with a minimum capacity of 200 000 population equivalents.

Project objectives

This LIFE+ISR project aims to demonstrate the environmental and economic benefits of two highly innovative sludge pre-treatment technologies that substantially reduce waste (i.e. sludge) production at municipal WWTPs. Both complementary technologies realise substantial sludge reduction, but are targeted at different types of WWTPs and situations.

Optigest is a novel technology for sludge digestion, in which the hydraulic retention time and solids retention time are separated. Implementing Optigest results in sludge reduction, increased sludge volume handling capacity and enhanced biogas production. This technology will be tested in the facilities of the Tollebeek WWTP.

Thermocrack is an innovative technology based on thermal pre-treatment of sludge, which results in sludge and chemical reductions and enhanced biogas production. This technology will be implemented in the facilities of the Kralingseveer WWTP, which already has a digester.

Expected results

The demonstrated technologies together result in an annual reduction of almost 8 000 tonnes of waste production, a 900 t reduction in CO₂ footprint and an increased energy production of 29.2 TJ/yr.

For Optigest, at WWTP Tollebeek:

- Annual reduction of 4 200 t in waste production (30%);
- Annual reduction of 600 t (38%) of the CO₂ footprint;

LIFE13 ENV/NL/000178

Life+ISR



Beneficiary:

Type of beneficiary

Local authority

Name of beneficiary

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Yill HAVERS

Duration of project:

55 months (01/06/2014 – 31/12/2018)

Total budget in euro:

7,268,722.00

EC contribution in euro:

1,634,161.00

Themes: Climate change – Energy: Energy efficiency – Energy saving – Energy supply – Reduction of greenhouse gases emissions / Environmental management: Cleaner technologies / Risk management: Pollutants reduction / Waste: Waste reduction – Raw material saving / Water: Waste water treatment

- Annual reduction of 10% of chemical usage (polyelectrolytes) for dewatering sludge;
- An increased energy production of 12.2 TJ/yr; and
- A 3-5% reduction in greenhouse gas (GHG) emissions related to sludge treatment.

For Thermocrack, at WWTP Kralingseveer:

- Annual reduction of 3 629 t waste production (11%);
- Annual reduction of 3 000 kg (100%) of AntiFoam usage;
- Annual reduction of 7 000 kg (6%) of chemical usage (polyelectrolytes) for dewatering sludge;
- An annual reduction of 290 t of the CO₂ footprint (8%);
- An increased energy production of 17 TJ/yr (33%); and
- A 3-5 % reduction in GHG emissions related to sludge treatment.

Solar panels as integrated constructive elements in highway noise barriers

Project background

Highway noise is a serious environmental problem in urbanised areas. Noise barriers, of various shapes and design, have been erected along highways in densely populated areas for over 20 years. These have lowered noise levels and can help improve air quality. Meanwhile, electricity is increasingly produced from solar power using photovoltaic (PV) cells, which help to lower greenhouse gas emissions. Solar panels have been installed on existing noise barriers, but the results are sub-optimal. In recent years, bi-facial solar cells have been developed that can produce electricity from light falling on both sides of the PV module. Such a module can produce over 30% more power on an annual basis compared to a standard module with a white back-sheet. Furthermore, the power output of the module is also less sensitive to orientation, and the module does not need to be placed facing south: east-west is also possible. These modules have great potential for integration with noise barriers.

Project objectives

The main objective of the LIFE Solar Highways project is to demonstrate the technical feasibility and the environmental, social and financial benefits of using multifunctional constructive elements for building highway noise barriers, in which bifacial PV modules have been integrated. A successful demonstration would accelerate the use of PV modules and noise barriers along Europe's highways, greatly contributing to the achievement of EU objectives concerning climate change, reducing noise levels and improving air quality.

Specifically, the project aims to:

- Demonstrate the technical feasibility of integrating PV cell technology in widely applicable highway noise barriers;
- Develop a technological-financial model to convince investors that the return on investment is sufficient;
- Develop, install and test a 450 m long prototype with an integrated bifacial PV solution;
- Demonstrate the energy yield that can be achieved during an 18-month testing period in the field; and
- Draw up a business case, demonstrating that the tested integrated PV noise barrier has a lower total cost of ownership than currently used solutions.

LIFE13 ENV/NL/000971
LIFE Solar Highways



Beneficiary:

Type of beneficiary

National authority

Name of beneficiary

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Sophie LAUWAARS

Duration of project:

73 months (01/06/2014 – 30/06/2020)

Total budget in euro:

3,740,724.00

EC contribution in euro:

1,404,837.00

Themes: Air and Noise: Noise / Climate change – Energy: Energy supply - Reduction of greenhouse gases emissions / Land-use and Planning: Urban design / Risk management: Pollutants reduction

Expected results

- Demonstration of a 450 m long prototype noise barrier, 6 m high with 4 m high PV panels on both sides, along a north-south stretch of the A16 near Dordrecht. Target performance is 90% of time in use and output of 300 MWh/year based on full time performance during the 18-month testing period;
- A business case for the technical and financial feasibility of the prototype, featuring a cost reduction of 20% compared to PV added to existing noise barriers;
- Design of a module, based on bifacial PV cells, which can be integrated in highway noise barriers; and
- A comprehensive benchmark study on PV elements and their use as integrated construction elements in highway noise barriers.

Crude glycerine water used on-site as a feedstock in an anaerobic digestion reactor to produce the renewable fuel biogas

Project background

The production of oleochemicals creates crude glycerine as a by-product, which is a solution of around 85% glycerine and 15% water plus contaminants. Glycerine has over 1 500 known end uses, for instance, in cosmetics, toiletries, personal care, drugs, and food products. However, processing consumes high amounts of energy and uses aggressive chemicals, such as phosphoric acid and caustic soda. Other waste streams, such as salts and non-reusable residues including heavy metals, are ultimately dumped in old salt mines. In addition, applications of pure glycerine only require small amounts, so demand greatly exceeds crude glycerine availability. Therefore, alternative uses of low-value crude glycerine are desirable to avoid it becoming a waste product.

Project objectives

The QUARTERBACK for LIFE project's main objective is to mitigate the environmental consequences of the production of crude glycerine in the oleochemical industry. The aim is to demonstrate, in the first full-scale application of its kind, both the technical and economic feasibility of operating an integrated process in which crude glycerine is used as the only feedstock for an anaerobic digestion process in order to produce biogas for local use.

The project aims to deliver the following economic and environmental benefits:

- Concentration of glycerine water for the refining process is avoided, resulting in energy savings from water evaporation and cooling processes;
- Improved conversion efficiency of the plant's combined heat and power unit;
- Substantial water savings made by reduced steam consumption and cooling water;
- Electricity usage reduced for effluent treatment by improving aeration and mixing;
- Reduction of facility water intake and salt discharge to surface waters;
- Reduction in demand for boiler feed water treatment and process cleaning chemicals;
- Improved quality of life in the local area by reducing facility noise and odour emissions; and
- Avoidance of road and waterway transport movements by reduced chemical use and off-site crude glycerine refining.

LIFE13 ENV/UK/000401
QUARTERBACK for LIFE



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Duration of project:

37 months (01/06/2014 – 30/06/2017)

Total budget in euro:

11,179,407.00

EC contribution in euro:

1,996,370.00

Themes: Climate change – Energy: Energy efficiency - Energy saving - Energy supply - Reduction of greenhouse gases emissions/ Environmental management: Cleaner technologies / Industry-Production: Chemicals / Waste: Industrial waste - Waste use / Water: Water saving

Expected results

- Design, construction and optimisation of the integrated demonstration process;
- Discontinuation of glycerine water evaporation resulting in a 6% reduction of steam (15 000 t/year) and 3% reduction in electricity use (1 200 MWh/year);
- Generation of 9% of the facility's electricity needs by self-produced and sustainable biogas;
- The installation of an engine heat recovery and hot water distribution system to replace process steam heating, resulting in 10% increased energy efficiency and 15% reduced steam consumption;
- Reduced chemical demand for boiler feed water treatment and process cleaning; and
- Termination of deep groundwater extraction for cooling, resulting in water usage of plant reduced by 20% (500 000 t/year) and discharge to the river of dissolved salts decreased by 325 t/year.

REPURPOSE - equipping community groups in estates to reuse more, clear fly tipping and improve their local environment

Project background

Local and regional governments are responsible for the collection and management of waste in the UK. Over the past 20 years, this role has moved from one of simple waste collection to the introduction of recycling services and, latterly, an increased focus on re-use and waste prevention. This has been delivered with varying degrees of success; one challenging area is the provision of such services in high- and low-rise housing estates. In such urban estates, re-use levels of key household products are currently very low. High levels of illegal dumping also occur in the UK.

Project objectives

The RE-PURPOSE LIFE project was developed in response to the flagship initiative 'A resource-efficient Europe' under the EU 2020 strategy, and translates its commitments into a transferable approach for establishing locally developed, enterprise-led solutions for re-use in social housing contexts. The project aims to support community groups that wish to create their own social enterprises for turning redundant spaces into re-use hubs for the collection, storage and repair of bulky re-use items, which provide an alternative to illegal dumping.

Specifically, the project aims to:

- Increase re-use in target estates by building links with local community re-use organisations, tenants and residents associations; training community groups on how to collect, repair and re-use bulky waste items; building community collection, repair and re-use hubs in unused spaces within estates; and offering empty flat clearance services in agreement with local re-use organisations;
- Reduce incidences of illegal dumping on target estates by enabling community groups to clear bulky waste themselves and identify suitable items for re-use; by raising awareness of illegal dumping among community groups in estates; and by enabling communities to identify problem areas and individuals; and
- Increase skills and income for community groups on target estates by establishing re-use depots or repair centres; training community groups in repair skills; linking re-use and recycling project activities with accredited training; setting up outlets to derive income and to supply affordable goods; and offering a repair service for household goods.

LIFE13 ENV/UK/000493
REPURPOSE LIFE



Beneficiary:

Type of beneficiary

NGO-Foundation

Name of beneficiary

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Duration of project:

32 months (21/07/2014 – 31/03/2017)

Total budget in euro:

1,122,721.00

EC contribution in euro:

534,642.00

Themes: Information-Communication: Environmental training - Capacity building / Waste: Municipal waste (including household and commercial) - Waste use

Expected results

- Increased re-use in target estates by 25%;
- Reduced incidences of illegal dumping on target estates by 25%;
- Increased skills and income for community groups on target estates;
- Creation of at least five appropriate re-use depots/repair centres on estates using redundant space;
- Agreement of a partnership with existing London Re-use Network member community re-users/repairers to train community groups in repair skills;
- Support for the creation of at least three financially sustainable pop-up shops or other outlets for community groups to derive income and to supply affordable goods to incoming tenants;
- Accredited training sessions linking re-use and recycling set up and freely available; and
- Creation of a repair service for household goods in at least one estate.

Delivery of the Water Framework Directive through collaborative action between civil society and the private sector

Project background

Freshwater ecosystems provide a vital service for communities and nature. Throughout Europe they are under pressure due to pollution, morphological change, increasing water consumption, climate change and other factors. The Water Framework Directive (WFD) was introduced in 2000 to impose firm timetables for reversing the long-term decline in Europe's freshwater environment. The directive's main objective is the achievement of "good ecological status" (GES) in all European water bodies by 2015. However, the implementation of the WFD across Europe has been inadequate, according to an EC assessment of River Basin Management Planning (RBMP) in 2012, which contained recommendations for a second cycle of RBMP aimed at achieving WFD goals. It listed the following reasons for ineffective WFD delivery: low ambition to implement the framework directive with no new policies; existing mechanisms focusing only on direct polluters and not supply-chain stakeholders or indirect polluters; lack of transparency in decision-making; limited knowledge exchange across the EU; and ineffective implementation of programmes of measures.

Project objectives

The long-term goal of the WaterLIFE project is to contribute to the delivery of the WFD across the EU, by helping to restore rivers to good ecological status. Its aim is to move all surface water bodies within demonstration catchments to GES faster than predicted by the 2009 RBMP. The project is designed to offer timely support to governments in the development of the second cycle of the RBMP, and to demonstrate that there are civil society and private sector-led mechanisms that can work if supported by an adequate policy framework. WWF's ambition is that the 2015 RBMP contains measures sufficient to get 50% of rivers to GES under the WFD by 2021.

Specifically, the project aims to:

- Create policy-enabling conditions, so that policy, guidance and legislation in the UK, and other EU countries, supports an accelerated and collaborative delivery of the WFD;
- Promote water stewardship innovation, through a wider business commitment;
- Demonstrate civil society governance, with local and regional civil society groups empowered in WFD advocacy and engaged in RBMP development; and
- Improve European knowledge exchange, with demonstrated private sector and civil society methodologies

LIFE13 ENV/UK/000497
LIFE WaterLIFE



Beneficiary:

Type of beneficiary

NGO-Foundation

Name of beneficiary

WWF-UK

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Janet MILLER

Duration of project:

36 Months (01/07/2014 – 30/06/2017)

Total budget in euro:

2,249,728.00

EC contribution in euro:

1,124,414.00

Themes: Habitats: Freshwater / Information-Communication: Awareness raising – Information - Environmental training - Capacity building - Public and Stakeholders participation / Water: River basin management - Water resources protection

of WFD implementation, and associated policy-enabling conditions, that are widely applicable across the EU.

Expected results

- Measurable improvements towards GES demonstrated in five river catchments across the UK;
- UK government implements enabling conditions to accelerate achievement of WFD objectives;
- At least five multinational food and drink businesses engaged on WFD policy issues across the EU and committed to pursuing water stewardship approaches in two catchments;
- At least 500 civil society groups engaged in RBMP development across Europe; and
- WaterLIFE knowledge exchange participants to have received training on capacity building, and to have contributed methodologies that are transferable across the EU.

Smarter Regulation of Waste in Europe

Project background

Waste streams that are of low quality and value, or are difficult to treat, persistently attract criminal activities that profit at the expense of the environment and legitimate operators in Europe's waste industry. These illegal practises are constantly changing and are not easily visible. For environmental and partner bodies, there are big gaps in understanding how such illegal markets behave and how to tackle criminal behaviour. This poses opportunities for innovation.

Project objectives

The 'LIFE SMART Waste' project aims to demonstrate innovative ways of understanding, tackling and reducing waste-related crime. The project will develop, test and apply new and modern ways of working, and demonstrate direct interventions to assess and target illegality in waste streams. The innovative aspect lies in the 'collaborative approach', where environmental bodies set intelligence objectives using common tools around shared areas of concern, then together identify and tackle illegality.

Specifically, the project aims to:

- Develop and demonstrate innovative intelligence gathering and analytical approaches to identify and understand waste crime issues associated with 'challenging' waste streams, problem waste operators and illegal waste activities;
- Design innovative intelligence-led interventions, and demonstrate how these can be used to tackle waste crime issues and reduce their impacts in targeted areas; and
- Communicate the project results, sell the benefits of the approach in tackling waste crime, and influence European policy and legislative changes.

Expected results

- New practices and technologies tested and available for use by interested enforcement agencies in Europe, with six or more environment or enforcement agencies (not participating in the project) adopting a product in their environmental crime work;
- An intelligence-sharing facility available for use by interested enforcement agencies with three or more agencies (not participating in the project) using the intelligence hub beyond the life of the project;
- At least four agency partnerships sustained or created after the project is finished;

LIFE13 ENV/UK/000549
LIFE SMART Waste



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

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Catherine PRESTON

Duration of project:

60 months (02/06/2014 – 31/05/2019)

Total budget in euro:

4,325,101.00

EC contribution in euro:

2,146,825.00

Themes: Information-Communication: Environmental training - Capacity building - Public and Stakeholders participation / Risk management: Risk assessment and monitoring / Waste: Industrial waste - Municipal waste (including household and commercial) / Water: Water management and supply - Water quality improvement

- One short-term and one term-term policy or legislative change recommendation adopted, and one domestic policy change intervention adopted in a Member State;
- Case studies detailing the application of smart, intelligence-led regulation and its benefits, including awareness-raising activities;
- Training packages and courses for enforcement organisations with six agencies (not participating in the project) adopting intelligence-led and/or novel tools; and
- Illegal waste practise interventions applied to disrupt or mitigate illegal behaviours, with at least three illegal operations detected and disrupted and a minimum of €0.5 million saved by stopping criminal activity.

Sustainable production of bio-methanol by bio-methane and biogene CO₂ gas from organic waste and residue

Project background

Glycerine (a colourless, odourless and non-toxic alcohol) is used in a wide range of applications in the medical, pharmaceutical, cosmetic and food industries. The production of bio-diesel has increased significantly in recent years, which has led to a surplus in its principle by-product, crude glycerine.

Crude glycerine is currently used to create methane, a more sustainable and cost-efficient energy source than non-renewable fuels. The conversion of biogas is, however, inefficient (35-40% electrical efficiency, <20% heat efficiency) and it is more valuable and sustainable to use crude glycerine to create biochemical products, such as methanol. Methanol is usually derived from natural gas or other fossil carbon sources. Bio-methanol can, however, be produced using a combination of a thermochemical process and conventional methanol synthesis. This method is chemically identical to conventional methanol production, but with up to 75% energy conversion efficiency and a reduction in fossil fuel use and greenhouse gas emissions. However, currently, this thermochemical process can only be carried out using high-quality crude glycerine. This generates residual waste, consumes a lot of energy and means that raw materials and residues have to be transported, ultimately leading to significant CO₂ emissions and negative impacts on the environment.

Project objectives

The LIFE SynSpirit project aims at demonstrating a new anaerobic fermentation process through which organic waste streams and low-quality crude glycerine are efficiently converted into high-value bio-methanol. For the first time, the project will connect a biological anaerobic digestion process for crude glycerine with the sustainable thermochemical production of bio-methanol, based on high quality glycerine.

Expected results

- The efficient conversion of a low-value by-product into a valuable renewable product, helping to improve resource efficiency and reduce CO₂ emissions;
- An industrial-scale SynSpirit process, connected to an existing bio-methanol production process, installed and ready for operation;
- A technically and economically viable SynSpirit process operating within the following performance indicators over a 12-month demonstration period:

LIFE13 ENV/UK/001339

LIFE SynSpirit



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

Shanks Group plc

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Duration of project:

43 months (01/09/2014 - 31/03/2018)

Total budget in euro:

10,846,447.00

EC contribution in euro:

1,414,993.00

Themes: Climate change – Energy: Energy supply - Reduction of greenhouse gases emissions / Risk management: Pollutants reduction / Waste: Industrial waste - Waste use

- A continuous and predictable mechanical and biological process;
- The continuous production of biogas at the rate of 1 300 - 1 400 m³/hour from 12 000 t of mixed quality crude glycerine, 12 000 t of organic material and approximately 50 000 m³ of waste water;
- High syngas injection availability (97%);
- Chemical Oxygen Demand (COD) to biogas removal efficiency of >95%;
- High hydrogen sulphide (H₂S) removal efficiency;
- Digestate (a product of anaerobic digestion) /waste water quality that meets the criteria of current waste water treatment plants;
- The annual production of 13 750 tonnes of bio-methanol; and
- The production of technical evaluation and performance monitoring reports.

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